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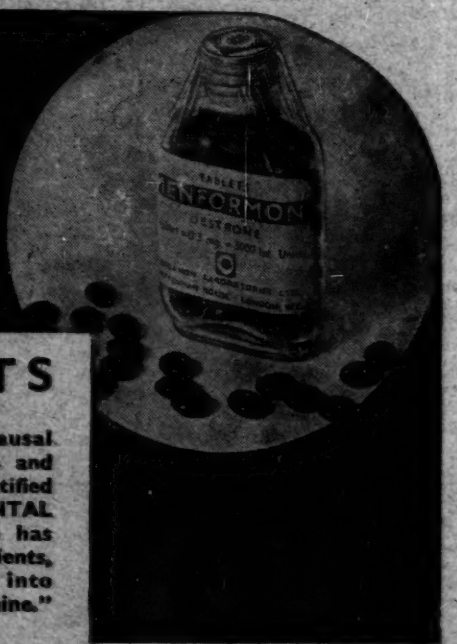

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PROC. ROY. SOC. MED. Vol. XXIX. Page 1094

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GENERALIZED VACCINIA

BY

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The term "vaccinia" is used to denote the development and decline of an eruption at the site of inoculation with the virus of vaccinia, and the concurrent reaction of the body. Ordinarily the eruption is limited to that site, and occasionally "supernumerary" vesicles arise on the neighbouring skin. Rarely the eruption, with or without the supernumerary elements, appears also on other parts of the body, and this condition is known as "generalized vaccinia." The name is not good, because when vaccinia is running its course the virus becomes distributed throughout the body and vaccinia is therefore general (Cory, 1898; Committee on Vaccination, Report, 1928). "Vaccinal eruptive fever" was suggested, but in a successful Jennerian vaccination there is always eruption at the site of scarification, and usually there is some fever; on the other hand, apyrexia is not uncommon in generalized vaccinia. "Generalized cutaneous vaccinia" has been used, and is more satisfactory. There is convenience, however, in sticking to the designation that has been sanctioned by long use.

Vaccinia, therefore, is the normal result of a successful vaccination and is not a complication of vaccination, though generalized vaccinia may be regarded as such. Vaccinia is, in fact, a pathological entity with an exanthem, and like other exanthemata it has the stages of incubation, evolution, and decline; but as it is—to use the old distinctions—contagious and not infectious its eruptive capacity can be gauged only by the results of particular artifice and peculiar accidents. Generalized vaccinia has occurred in children who had sucked their vaccination pocks and in a child (though there is some element of doubt here) suckled by its mother, who was undergoing vaccinia. In persons previously insusceptible to ordinary vaccination it has been produced by the internal administration of vaccine crusts either ingested with food or insufflated into the nose. It has been produced in horses by the administration of vaccine lymph through the alimentary, circulatory, and respiratory systems (*Allbutt's System of Medicine*, 1912), and in other experimental animals by the intravenous injection of vaccine lymph (Blaxall, 1930). The number of these observations is very small and the proportion of eruptions very great compared with the vast number of human vaccinations that have run their course without a general eruption. To some degree, then, the occurrence of the condition is influenced by the route of invasion: the least provocative, or most inhibitive, is the skin, and the analogy to small-pox has long been recognized; for inoculated small-pox as practised during the latter part of the eighteenth century gave usually a much less general rash than did the disease acquired naturally through the respiratory passages, and might even not cause any eruption beyond that on and near the site of inoculation. This mildness cannot be claimed, however, for the inoculated small-pox of the preceding years, because then the eruptions were often profuse; in those years the inoculum was taken from cases of natural small-pox, whereas later it was invariably taken from persons undergoing the inoculated disease. Ledingham's explanation for the reduced amount of eruption is that the artificial propagation by arm-to-arm passage modified the character of the virus, perhaps towards the character of the virus of vaccinia, and he bases this view on the fact that small-pox can become vaccinia by repeated passage through suitable animals.

It has, however, been suggested that some amount of antibody was produced by the skin at the site of inoculation of small-pox and was a factor in attenuation of the induced attack. As to vaccinia, though it is true that immunity can be obtained without vesiculation, Henderson and McClean (1939) have shown that the skin is of some importance in the production of immunity—a view taken by F. R. Blaxall. They investigated the effect of intracutaneous and subcutaneous vaccination with a bacteria-free elementary-body suspension of vaccinia virus on the production of immunity as tested by a cutaneous (scarification) vaccination with ordinary vaccine lymph six weeks later. Of 164 persons vaccinated in either of the above ways with elementary-body suspension, 75 developed a vesicle and 72 of them were immune to vaccinia on subsequent testing; of the 89 who did not develop a vesicle 31 only were found to be immune. As to cutaneous scarification, the 22 persons inoculated thus with ordinary vaccine lymph produced vesicles and all were immune on testing later, and of 24 scarified and vesiculated with elementary-body suspension 23 gave in due course a satisfactory result in immunity. There was correlation, therefore, between vesicle production and immunity.

In the intravenous experiments with ordinary lymph referred to above, generalized vaccinia often did not result, but later on it was demonstrated that adequate intravenous doses of the lymph and, better still, of certain strains of the virus (neurolapine and neurotesticular lapine) could give rise to typical vesiculation on the skin and marginal mucous membranes of animals, including monkeys, cats, and dogs. After full doses of these strains the virus could be recovered from most of the internal organs, and macroscopic lesions were found in most of the viscera (Douglas *et al.*, 1929). Thus, by stepping up the dosage and using certain strains of the virus, generalized vaccinia can be made fairly constant in incidence and often severe in attack.

The dosage, strain, and to some extent the portal of entry are factors, therefore, in the production of generalized vaccinia in experimental animals. In human vaccination the dose is small, the lymph is a dermal strain the potency of which is far below that of the experimental strains of the virus, and the entry is by the skin. It seems thus to be the office of the skin that is in question: does its failure to produce antibody, or sufficient antibody, at the vaccination site result in generalized vaccinia? But in those human subcutaneous and intracutaneous vaccinations in which the intention of avoiding vesiculation has been achieved generalized vaccinia does not seem to be more prone to occur than in Jennerian vaccinations, and, for what it is

worth, the observation can be made that in generalized vaccinia the vesicle of vaccination does not differ in development and aspect from those in normal cases. We may presume, then, that whatever be the relation of the vesicle to immunity, a lack—this is, a deficiency or an absence—of general response in immunity is the cause of the complication, if, indeed, a severe attack of an infection can be called a complication because it is rare.

Eczema Vaccinatum

Reference may be made here to eczema vaccinatum. This has been described as occurring in vaccinated persons with a history of attacks of eczema and in children suffering from eczema who, being in familial contact with someone undergoing vaccinia, had presumably been inoculated on the eczematous area through accident. An eruption of a vaccinial character appears on the eczematous site, which itself becomes intensely swollen and inflamed; the eruption may spread to healthy areas of skin, and when it is profuse the outlook is grave. Tedder (1936) considers that the conditions known as Kaposi's varicelliform eruption and pustulosis vacciniformis acuta are not only one and the same but are identical with eczema vaccinatum, and that failure to obtain a history of exposure to the vaccine virus has in most cases been the only reason for not identifying the former with eczema vaccinatum. It might be inferred, then, that an unhealthy state of the skin, some itching dermatosis, is the cause of generalized vaccinia, and, in alluding to Tedder, J. D. Rolleston (1937) gives the interesting fact that his own case of generalized vaccinia had recently suffered from varicella. A remarkable series of vaccinial eruptions on injured or diseased skin has been detailed by Nimpfer (1936). A child admitted to hospital with burns of the first and second degrees was vaccinated on admission; eight days later vaccinial pustules appeared on the burned surface. This was obviously the result of blood-borne virus; but thirteen days afterwards a patient in the same room and suffering from burns of the second and third degrees showed vaccinial lesions on the burnt surfaces, and ten days later a child with dermatitis, in a distant room but nursed by the same staff, developed generalized vaccinia. A fourth case, also of burns, developed vaccinial lesions six days later. Danziger (1907) recounted a similar occurrence in children affected variously with eczema and impetigo. These sorts of accident can be avoided by discretion in vaccination and care during vaccinia.

Though it is not disputed that a diseased or damaged part of the skin is vulnerable to direct infection by the vaccine virus, and perhaps also highly susceptible to the virus blood-borne (haematogenous) from the site of intentional vaccination, there is no evidence that generalized vaccinia—that is, the condition seen in the ordinary practice of vaccination—is due to a latent unhealthy state of the skin. Tedder's conclusion is: "True generalized vaccinia represents a disturbance (following vaccination) of the balance between the virus and the virucidal substances which it calls for in a person having an intact healthy skin, so that the virus which is disseminated haematogenously becomes active in the skin, producing a generalized vesico-pustular eruption, lesions on the mucosae, and general symptoms." As a balance can be disturbed to either side this statement is not precise, and its meaning can be put into three words—lack of antibody.

Incidence of Generalized Vaccinia

There is no doubt of the infrequency of generalized vaccinia. Numerous estimates of its incidence have been made, ranging from 1 in 10,000 to 1 in 100,000, and even 1 in 900,000 (Chaudhuri, 1940). For a considerable number of years all reports of cases of generalized vaccinia and other eruptions sent by the public vaccinators of England and Wales to Lieut.-Col. W. D. H. Stevenson, Director of the Government Lymph Establishment, have been subjected to special scrutiny, and to inquiry where deemed advisable, and the statistics so derived can be taken as ample for a fair computation. During the period July 1, 1932, to June 30, 1937, in 1,026,588 vaccinations 15 cases of generalized vaccinia and 11 doubtful cases were reported, giving, if the doubtful cases are included, an incidence rate of not more than 1 in 39,484 vaccinations (Shaw and Stevenson, 1939). If the doubtful cases are excluded the rate is 1 in 68,439. Since the publication of those figures a wider survey of the establishment records has been made by Stevenson and Cox; this covers four years—1909-10 and 1921-2—taken at random, and the period from July, 1932, to June, 1941. The total number of vaccinations reported by public vaccinators was 3,289,733, with 34 accepted cases of generalized vaccinia; 35 reported cases were considered on inquiry to be doubtful enough to warrant exclusion. The accepted cases gave, therefore, an incidence rate of 1 in 96,756, with 4 deaths—a fatality rate of 11.7% and a mortality of 1.2 per million vaccinations. There was no death among the rejected cases.

Some years ago a questionary on the incidence of generalized vaccinia was addressed by the Ministry of Health to 28 public vaccinators selected on account of their long experience in vaccination. Replies were received from 26; of these, 17 reported that they had seen cases "occasionally" or "not for some years," or that they had seen one case within a stated period. Three had not seen a case in, respectively, 32, 28, and 27 years. As to supernumerary vesicles, one vaccinator was of the opinion that they occurred in less than 1% of vaccinations; another had not seen any in 27 years; and a third had not had more than 6 instances in many thousands of vaccinations.

Incidence in Adults.—It is widely believed that generalized vaccinia is more rare in adults than in children. Only 1 patient in the above 34 was beyond childhood, and was aged 17 years. The number of adult vaccinations reported by the public vaccinators is not available from our central records, but it can be said that in a period of several years during which nearly four million doses of lymph for adult use were issued by the Government Lymph Establishment only one instance of generalized vaccinia was reported among those adults. The experience of Froumy, reported by Haslund and quoted by Anders (1919), is surely unique. He vaccinated 175 cadets, all of whom had been successfully vaccinated in earlier life; of these, 64 had normal vesicles, 56 had small vesicles, and 55 were unsuccessful. Of the 64, 8 developed an eruption that may have been vaccinial, and 12 developed typical vaccinial pustules on face, trunk, and extremities; in 4 of the 12 the eruption was considerable, and it appeared even on the mucous membranes.

Secondary and Tertiary Vaccinations.—There is no record at the Ministry of generalized vaccinia in secondary or tertiary vaccinations, but Froumy's cases show that secondaries may not be exempt, and an instance in a tertiary was published by Stewart (1902). The risk is, of course, inversely proportional to the amount of immunity remaining from the previous vaccination.

Vaccinial Rashes

The various kinds of vaccinial rashes sometimes cause difficulty in diagnosis when small-pox is present in the district. During the small-pox epidemic of 1902 Chalke (1931) made a study of these, and he concluded that by far the greater number were accidental and either were in the nature of serum rashes (erythematous, scarlatiniform, morbilliform, and urticarial) or were due to the absorption of toxic products from the vaccinial site; that other symptoms of serum disease were not often encountered and the introduction of a small amount of serum in the operation of vaccination did not act as a sensitizing dose; and that vaccinial rashes of any type were rare among revaccinated subjects.

The rashes reported to the Ministry have been described by the public vaccinators as papular, pustular, punctate, erythematous, morbilliform, urticarial, roseolar, eczematous, and macular. From the records of six consecutive years Stevenson has computed that the incidence of all rashes, including generalized vaccinia and supernumerary vesicles (but excluding rashes near the vaccination vesicle and probably due to faulty dressings), was 1 in 7,755 vaccinations. It must be noted, however, that the occurrence of a vaccinial rash after a public vaccinator has ceased his routine visits to a normally progressing case of vaccinia may not be brought to his knowledge, particularly if the rash is mild and evanescent; doubtless, therefore, the true incidence is somewhat greater. But in a recent period of mass vaccination in Glasgow a ratio approximately as high as 1 in 4,000 was recorded; no instance of generalized vaccinia was found in a total of about half a million vaccinations (Bloch, 1942).

One case of mild pemphigus, one of petechial rash, and two of purpuric rash have come to our notice, but purpura

associated with vaccination is very rare; the number of recorded cases is probably less than a dozen, though Heaton (1940), in reporting a case, quotes a statement of Trant that the occurrence was noted as long ago as 1842. In the experience of Stelwagon (1902) the most frequent generalized manifestation was "a mixed type of urticaria and erythema multiforme, or better described as an erythema multiforme with often itching and other features of urticaria." It is probable that in the majority of instances the vaccinial rash is anomalous in its being a mixture of lesions and not a single dermatosis, and possible that allergy is an important factor in causation.

Vaccinial rashes may appear at any time in the course of vaccinia from the day after vaccination, the earliest being mainly the erythematous and urticarial, but the incidence of rash is low in the first week, and available figures indicate that the majority—say 80%—develop in the period from the 7th to the 11th day after vaccination.

Generalized vaccinia has no prodromal rashes: the occurrence of a rash prior to or along with the specific eruption is fortuitous. It is only a papular rash that should raise suspicion of generalized vaccinia, and even then the diagnosis should, as Shaw and Stevenson suggest (1939), be withheld unless the papules proceed to vesiculation. The eruption usually affects the trunk more than the limbs and, as mentioned before, it may appear on the mucous membranes. In a fatal adult case reported by Anders (1919) the eruption had extended to the trachea. Turnbull (1941) has published an unusual case of dysphagia due to swelling of the tongue caused by the eruption on it of two vesicles: the case, which was fatal, is of interest because of its extreme rarity. The only previously recorded instance of interference with feeding appears to be that of a case brought to the notice of the Royal Commission on Vaccination (1896); the presence of vesicles in the mouth prevented the infant from sucking, and death ensued.

Concurrence of Generalized Vaccinia and Post-vaccinial Encephalitis

The concurrence of two conditions so rare as generalized vaccinia and post-vaccinial encephalitis must be a very remote chance—one in many millions—and only 8 cases appear to have been described or mentioned. One reported by Weichsel (1931) may be accepted. A fatal case described by Paisseau and Scherrer (1929) had singular symptoms: the legs from the knees downwards and the feet were cold and blue, the forearms and hands were cold and blue, almost black. The general eruption consisted of 3 pustules near the vaccination pustules, 1 on the back of the arm, 1 near the axillary fold, and 1 on the upper part of the back—a distribution that hardly escapes from the category of supernumerary vesicles. These authors mention, without traceable reference, a case of generalized vaccinia and post-vaccinial encephalitis that had been published before theirs. Jorge (1927), on the authority of Garret, gave an account of a case of vaccinial eruption with meningeal symptoms, followed by blindness and deafness, that cleared up after five months. Jorge also mentions an encephalitic case of Netter and Cestas's in which a vaccinial eruption appeared on the thigh 14 days after vaccination; the site of vaccination is not stated. Mexico, however, provides the most remarkable record. In that country 8 cases of post-vaccinial encephalitis were reported in the decennium 1928-37; of the 4 that recovered, 2 had residual paralyses with mental disturbance and 1 had residual deafness. The patient with residual deafness, and 2 of those who died, had generalized vaccinia.

In England and Wales only one instance of the suspected concurrence of the conditions has been brought to our notice, and after inquiry it was concluded that neither of them existed. Case 114 in the Further Report (1930) of the Committee on Vaccination may, however, be a true instance.

Generalized Vaccinia of the Foetus

Though vaccinia rarely influences the course of pregnancy there is considerable evidence that vaccination late in the pregnancy confers some degree of immunity on the foetus; but the immunity is transient, and is lost in a few weeks after birth. There does not appear to be any record of generalized vaccinia in a pregnant woman, and therefore much interest is attached to accounts of foetal eruptions following vaccinia in the mother. Lynch (1932) has published an account of an eruption, which he calls "pemphigoid vaccinia," in the premature and short-lived child of a woman vaccinated 27 days before the birth, and he is of the opinion that similar cases have been described in the past as intra-uterine variola. He has collected 8 cases from the literature, beginning with one recorded by Jenner; in all of them, as in his case, the mother was vaccinated because of the presence of small-pox either in the home or in the district, and none of the mothers developed a variolous eruption. If we reject one case (Siebold's) as too fanciful for credence it appears that the births took place from two to ten weeks after vaccination and that, of the 7 infants, 4 were stillborn, 1 was non-viable (5th month), and 2 died soon after birth. That these mothers passed through vaccinia and variola sine eruptione with variolation of the foetus is a probability too distant for contemplation, and in the light of Lynch's informative discussion it is reasonable to regard these as instances of generalized vaccinia of the foetus.

Auto-inoculation (Auto-vaccination)

Auto-inoculation is not generalized vaccinia; it is the result of the transfer of virus from the vaccination vesicle to one or more places on the skin, almost invariably by the fingers of the vaccinee and inoculated by scratching. For diagnosis the sites are suggestive, being commonly the face and the front of the body. Auto-inoculation sometimes induces generalized vaccinia; in this event, pocks do not cease to appear after suitable precautions have been taken, but continue to arise for as long, perhaps, as five or six weeks. The condition known as eczema vaccinatum has already been mentioned.

Post-mortem Findings

In the generalized vaccinia produced in rabbits by intravenous inoculation, usually of extremely active strains of virus in very large doses, lesions have been found in the lungs, liver, spleen, and suprarenals. In human generalized vaccinia there has not been the introduction of an overwhelming dose or of a virulent strain; the reaction is due to an inherent susceptibility and, as in other acute infections, death can ensue from toxaemia rather than from visceral damage. In a case examined by Dible and Gleave (1934) there was some oedema in the lungs and congestion of the bases, otherwise the respiratory system was normal, and so was the heart. The liver showed two small white, solid areas, each about 3–4 mm. in diameter; both were on the surface and visible beneath the peritoneal coat. Apart from some slight fatty infiltration the organ showed no other change. In the spleen there were some congested areas but no other visible abnormality. The remaining abdominal organs exhibited no naked-eye changes. The central nervous system showed general congestion but no other naked-eye lesion. The lesions in the two pocks in the liver were almost pure necrosis with karyolysis of the liver cell nuclei and a rapid conversion of the tissue into a granular unstaining mass; the lesions were as sharply delimited as the pocks in the skin. The spleen had a considerable number of necrotic foci, the largest 0.5 mm. in diameter; their histological appearance corresponded to that described in the liver and skin—the same pure sharply circumscribed necrosis, absence of reaction, minimal infiltration with leucocytes, and karyolysis of most of the nuclei: briefly, pure necrosis without haemorrhage and with a minimum of reactive change. No lesions were seen and no virus was demonstrated in the brain. The authors point out the similarity of the epithelial lesions to those of the older descriptions of small-pox lesions rather than to those produced in thin-skinned experimental animals such as the rabbit.

Diagnosis

The virus of vaccinia has been demonstrated in the blood as early as the third day after vaccination; on the other hand, it has been shown that the excision of a normally progressing vaccination site as late as the fourth day can prevent the full development of immunity. In theory generalized vaccinia is a late starter; it cannot be ahead of the local vaccinial reaction, and in practice it rarely runs equal. The fourth day after vaccination may be taken as the earliest day of appearance, and by far the commonest period is from the ninth to the fourteenth day. Delay to the twenty-third has been reported, as in Froumy's case, and in this curious event it must be supposed that immunity had not been firmly established. The end-point of cropping is indefinite; the eruption does not

ordinarily go beyond one crop, but new crops may appear up to five or six weeks, though this is unusual. By Cory's law the time taken in the maturation of pocks should be inversely proportional to the degree of immunity, and rapid maturation of new pocks will indicate that immunity is being developed. In diagnosis the following considerations will be helpful:

1. Auto-inoculation should be excluded.
2. The eruption does not appear earlier than the fourth, and seldom earlier than the ninth, day after vaccination.
3. The eruption must be elsewhere than in the neighbourhood of the vaccination site.
4. There must be a vesicular stage.

The eruption may arise on any part of the skin—limitation to one sole has been reported—and within the mouth. The distribution is not specific, and any resemblance to that of small-pox is accidental. When profuse the elements may show much diversity in size, up to that of a sixpence or even larger, as contrasted with the almost uniform size seen in discrete small-pox.

Treatment

In some quarters it is the practice to seek to prevent severe reactions in adult primary vaccinations by puncturing and evacuating the vesicle on the seventh or eighth day after vaccination and applying a dressing of permanganate of potash. This is not free from the risk of impairment of protection, as immunity against small-pox is not satisfactorily established before the ninth day and it would not be justifiable as an attempt to prevent the unusual complication of generalized vaccinia. Mervyn Gordon (1941) has suggested, however, that permanganate of potash, to which the viruses of both vaccinia and small-pox are extremely susceptible, might be effectively used in treatment by the application of a wet compress of the permanganate solution to the vesicles of the eruption. Even in a dilution of 1 in 100,000, he states, permanganate can inactivate the vaccinia virus, but glycerin should not be added, for it inhibits the virucidal action. He advises also that in a severe case trial should be made of serum from a recently vaccinated person—a treatment which, in fact, he was the first to suggest in post-vaccinial encephalitis. The most potent serum, in his opinion, would be that taken from young healthy adults 14 days after vaccination.

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An account of a case of mycotic endocarditis has been given by A. Wikler and his colleagues (*J. Amer. med. Ass.*, 1942, **119**, 333). The patient was addicted to heroin and had a mitral lesion. On two occasions during his life blood counts yielded a yeast-like growth subsequently demonstrated to be *Candida (Monilia) paracrusei*. The authors believe that careful laboratory work ruled out the possibility of contamination of the culture medium, and point out that during the past two years 5 cases of mycotic endocarditis have been recorded in cases of drug addiction; in 4 of these the infecting organism was *Candida paracrusei*, and in the fifth *C. guillermondi*. The authors were unable to isolate *Candida* from samples of heroin, and point out that this fungus is frequently found on the surface of the skin.

THE PROGNOSIS IN CIVILIAN HEAD INJURIES

BY

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The prognosis of accidents depends on many non-medical factors. Besides the results of organic damage there are social and psychological factors which profoundly influence the patient's health, happiness, and working capacity after an accident. Prognostic studies in the past have taken little account of these factors, though many discrepancies in recorded numerical results probably depended on such influences as the condition of the labour market at the time, the system of social insurance, and their consequent social and psychological effects.

The Accident and Rehabilitation Services which have recently been developed owe their existence largely to such considerations. In the publications on their organization, methods, and result very little reference has been made to the problem of head injuries, though the importance of these is far from negligible. Not only is their proportion among the accident admissions considerable—at this hospital about 30%—but their after-effects are generally regarded as serious in character and difficult to assess. It seemed of interest, therefore, to study the prognosis of head injuries, particularly at a time of comparatively standardized and favourable social conditions, when everybody has the choice of well-paid jobs and most employers are ready to facilitate gradual return to work.

All cases were treated by an active method of early rehabilitation. No patient was told to keep quiet; if he did so on account of unpleasant sensations he was early encouraged to move his head and body freely, to sit up, and, after a few days, to get out of bed. Lumbar puncture was carried out only where desirable for diagnostic purposes, and no dehydration was employed. Elsewhere I have described how, with this form of treatment, these patients suffered but little from headache (Guttmann, 1943). The same paper gives details of the severity and type of the accidents. The present paper deals with the results of the treatment on the loss of working time. Some references to earlier publications on the prognosis of head injury are appended. The figures reported are not easily comparable on account of the differences of time of follow-up, the proportion of cases re-examined, and the social conditions. Only Ritchie Russell (1932) has given a detailed analysis of similar material, and his figures are quoted on p. 95. But his patients were kept in hospital for at least three weeks.

Material

This paper is based on 300 consecutive admissions of head injury; among these were 255 civilians available for study. These cases, it must be emphasized, were the unselected accidents, mainly road accidents, of a mixed urban and rural area. Ten patients out of the 255 (4%) died; of the remainder 2 were permanently incapacitated owing to cerebral damage. The duration of the in-patient treatment is given in Table I.

TABLE I.—*Duration of In-patient Treatment (245 Cases)*

Up to 1 week	125
„ 2 weeks	76
„ 3 „	22
„ 4 „	12
Longer	10

Table I shows that just over 80% of all cases were discharged from hospital within two weeks of admission. Among the 245 incapacitated patients are included all cases with injuries elsewhere: 73 had major injuries, such as fractures of bones. All cases of mild head injury (i.e., with a post-traumatic amnesia of one hour or less) were treated in hospital fourteen days or less; three-quarters of the cases of moderate severity (post-traumatic amnesia up to 24 hours) and one-half of the severe cases (post-traumatic amnesia over 24 hours) were discharged within the same period. All cases which stayed in hospital four weeks or longer did

so on account of complications, such as fractures of the spine, pelvis, or extremities. After discharge from hospital the patients returned for further treatment to their own doctors, to whom a letter was sent. They came back to hospital for re-examination at a date when they were expected to be fit for work, and again three months and six months after the accident. Patients who failed to keep these appointments were followed up by the department's social worker. Table II gives the social classification of the patients.

TABLE II.—*Social Classification*

	Number
Children under school age	12
School children	29
Housewives, excluding married women going out to work	25
Wage-earners, including aforementioned	158
Owners of businesses	12
Not working, including chronic invalids	9

Results

All housewives returned to their work; but as their duties varied very much from case to case, as did the amount of help they received during convalescence, it did not seem possible to express their time off work in precise figures. The school children will be discussed in another paper.

Of the 158 wage-earners, 19 could not be traced after the first follow-up appointment, and no information about their taking up work was forthcoming. Six patients returned to work during the follow-up period, but no exact information was available as regards the total working time lost by them. Three patients expected their call-up and did not return to their previous work for that reason; they all joined the Services during the follow-up period.

The working time lost in 130 cases is given in Table III. It should be noted that all cases are included, whether they had injuries to other parts of the body or not. To compare the figures with those given by Ritchie Russell the respective tables have to be condensed, as under (Ritchie Russell's figures in brackets).

TABLE III.—*Loss of Working Time*

Weeks lost	1	2	3	4	5	6	7	8	9	10	11	12	13
No. of patients	4	18	10	18	18	7	9	10	3	4	2	4	5

Weeks lost	14	15	16	17	18	19	20	21	22	23	24	25	26 and over
No. of patients	—	1	1	1	—	—	3	1	1	1	1	—	8

Returned to work within 13 weeks	112	
Returned to work within 26 weeks or joined up	131	(110)
Not returned to work within 26 weeks	8	(29)

The crude average of the figures in Table III is 6.6 weeks, exclusive of those still off work at the end of the six-months period. Owing to the large scatter this average does not give a true picture, and it is fairer to say that 25% of the patients lost three weeks or less, 50% between three and nine weeks, and 25% more than nine weeks.

The low incidence of headache in these patients has been described in another paper (Guttmann, 1943). None of the patients relapsed during the first six months after the accident. Only those patients who had symptoms or signs at that date were given further follow-up appointments; apart from one case of post-traumatic epilepsy no patient reported any further loss of working time. Some of those off work after 26 weeks subsequently returned to their occupations.

Of the eight patients who did not return to work within 26 weeks only two were incapacitated by cerebral damage. Four were definitely neurotic, and a fifth very likely so. The last case showed neurotic symptoms superimposed on residual symptoms due to a fractured pelvis. Though other psychological factors could be found to account for the neurotic reactions, the compensation problem played a part in three out of the five non-organic cases. In order to see the importance of this factor in the correct light one has to compare these cases with the other occupational accidents. There were altogether 11 cases in this series with a claim under the Workmen's Compensation Act—the three cases mentioned and eight others. Of the latter eight cases six returned to work in 2, 3, 4, 5, 5, and 6 weeks respectively. Another case, off work for 10 weeks, was a serious injury with a post-traumatic amnesia of six hours. The last case was off for 16 weeks on account of a compression fracture of the spine. Claims against drivers and insurance companies arising out of road accidents were not here considered.

There was a higher proportion of compensation cases in Ritchie Russell's material; the mildly injured among them showed a tendency to stay off work comparatively longer. The lesser influence of the compensation in the present series may be due to the conditions of employment in wartime. But the number of cases is too small for any definite conclusions. The impression gained is that the compensation claim does not act as an incentive—conscious or unconscious—to produce a neurosis, but that in patients with latent difficulties the monetary compensation may enable them to stay off work when otherwise they might have put up with their symptoms. Delays and frictions in the compensation machinery increase and lengthen the neurotic symptoms. The psychological mechanisms have recently been described by B. Hart (1942), and the following case record illustrates some of them.

A carpenter aged 58 with a steady work record. While at work he fell down a 6-ft. hole. He was unconscious for a few minutes; his post-traumatic amnesia was 15 minutes. He had a fissure in his left temporal bone and a fracture of the right clavicle. Apart from slight nystagmus bilaterally, he had no neurological signs. He complained continually of some headache and giddiness, but was mostly handicapped by limitation of movement and pain in his right shoulder. This, he said, affected his head. The lack of power in his right arm was increasingly worse at subsequent examinations, though neither surgical nor neurological examination showed any objective signs to account for it.

On the day after the accident he was to have started in a new job for his firm. In order to see what this new job amounted to, he had opened the door to the stokehole where he was to work. No one had told him of the 6-ft. drop and iron stairs leading to the stokehole. This he still resented many months after the accident. At some medical examination he was told that there was nothing that medical treatment could do for him, and that he should find himself a lighter job. His comment was that he was a trade union man, and that so long as his compensation money was coming through he would sooner wait to be fit to resume his own job than take a light job meanwhile. He also had a grievance against the hospital because he was not seen by a particular doctor.

Of his previous history it is worth mentioning that he had not been fit for service in the last war on account of effort syndrome, and he had continued to suffer from this long after the war. He also mentioned spontaneously, in the course of the interview, that he never had much money to spend on himself, as all his three daughters had gained scholarships and he had to maintain them for the extra years, to pay for their training and so forth. The feeling that he deserved some rest and pay and consideration influenced his attitude very much.

Severity of Injury

The duration of unconsciousness is generally regarded as an indicator of the severity of a concussion. Ritchie Russell suggested using the duration of post-traumatic amnesia instead, as it is easier to assess. To test the prognostic value of this measure, the cases (excluding those patients kept off work by injuries to other parts of the body) were divided into four groups and the average off-work times calculated for each. Table IV shows clearly that the time off work increases with the length of post-traumatic amnesia (though only the difference between the first and the second group is statistically significant). Considering that the cases are entirely unselected, the figures may well be used as a prognostic guide: in other words, one may expect a patient with a post-traumatic amnesia of an hour or less

TABLE IV.—*Duration of Post-traumatic Amnesia and Loss of Working Time not affected by Injuries Elsewhere (105 Cases)*

Post-traumatic Amnesia	No. of Cases	Weeks	Difference	St. E.
Up to 1 hour	67	4·5 ± 2·08	1·10	0·539
1 day	27	5·6 ± 2·46	3·25	2·078
„ 1 week	7	8·85 ± 5·34	4·90	3·084
Longer	7	13·75 ± 4·65		

to be fit for work in about four weeks; with an amnesia up to about 24 hours, within about six weeks; and with an amnesia up to one week, within eight or nine weeks. This, however, does not refer to penetrating injuries; about these and other pitfalls of the prognosis, in the light of the post-traumatic amnesia, the reader must be referred to Cairns (1941).

In all those with mild concussion who stayed off work for seven weeks or more, psychological factors could be found to account for the fact. A few short examples may illustrate the point.

A boy with a momentary amnesia stayed off work for eight weeks. The reason he gave was a trivial scar, which, he said, prevented him from cycling to his work. In fact, he was badly shaken by the terrifying experience of being squeezed between a van and a wall while cycling.

A woman with a head injury incurred in an attempt at suicide during the third attack of a recurrent depression stayed away from work on account of her depression.

A nervous woman given to bilious headaches all her life stayed off work on account of post-concussional headache; she was employed on strenuous war work in a factory, and had the obvious attitude that she deserved a good rest.

A man with a trivial concussion and a haematoma round his eye, with transient restriction of eye movement, developed psychogenic symptoms referring to his eye first and general depression and anxiety later.

A short survey of the small number of independent shopkeepers and business men (12 in all) confirms the view that late effects of head injury are more often due to social and psychological factors than to the physical effect of the accident. All but one had had accidents of moderate severity. Five returned to work within two weeks, four within two months. The latter were inclined to take it easy—one among them on account of a mild endogenous depression, another for the duration of the settlement of an insurance claim. The psychological factors operative in the three remaining cases were more complicated. The following is the history of one of them.

A man aged 34 had a concussion with a post-traumatic amnesia of about six hours. Apart from a few lacerations of the scalp he had a fracture of the right zygoma which caused no disability. He was discharged from hospital 16 days after the accident, complaining only of slight giddiness. When seen again three months after the accident he showed generalized tremor of the shell-shock kind and a hysterical astasia abasia. The patient was a man of moderate intelligence. Until a short time before the accident happened he had been a general labourer employed on construction of an aerodrome near the village where he lived. He had earned an unusual amount of money, and, on the advice of his clever brother-in-law, he bought a lorry and undertook work for the contractor on his own account. A fortnight after he had started the venture the accident occurred: an Army lorry ran into him and his lorry was badly damaged. The Army authorities assumed responsibility for the repair, but he had not succeeded in getting the repair work done and had not received any monetary compensation so far. Everything was in the hands of his brother-in-law and the solicitors. There were probably additional reasons for the hysterical reaction. The patient had previously had an accident which had been followed by a considerable time off work and continuous headache.

This case, which mostly resembles the picture of compensation neurosis, is probably more correctly interpreted as the patient's reaction to his life situation, with which he was not able to cope. His position as an entrepreneur was already beyond him, and the complications created by the accident made him break down. It is very unlikely that he could, or actually did, expect any financial gain, beyond compensation for his loss.

Comment

The analysis of all the cases—it must be emphasized again that they are the unselected total of cases of head injury admitted to this hospital—gives some idea in how short a time the average patient can be discharged from hospital and become fit to return to work under the social conditions characterized in the beginning of this paper. The figures of off-work time given for the groups of different severity are somewhat below those suggested for similar cases by Cairns, and this is not surprising in view of the different social setting (civilian as against Service cases). This does not mean that all patients were free from symptoms when they returned to work: the social prognosis is not identical with the medical prognosis. Some patients complained of headache and a few of postural giddiness for a varying length of time (Guttmann, 1943); but they were able to adjust themselves to their symptoms, just as they had adjusted themselves to headaches and other symptoms before the accident. Several showed, when examined psychologically, some impairment of their mnestic functions; but this did not prevent them from returning to their previous work and doing it efficiently and willingly. (Such patients may find themselves handicapped when they have to change their occupation and to adjust themselves to new conditions; but this did not arise in the present series: it is generally of greater importance in intellectual workers, who are in the minority among hospital admissions.) A few cases showed emotional changes (slight euphoria or emotional indifference) which did not interfere with their working capacity, and may, indeed, have helped in adjusting them to their symptoms. Where return to work was delayed beyond the average periods it could be shown that social and psychological factors, rather than physical after-effects, of the injury were predominantly responsible.

This points to the need for psychological management in the early stages and for facilities for psychological treatment and social after-care in the convalescence and afterwards. It is impossible to estimate to what extent the outcome in this series was influenced by the interviewing and follow-up arrangements; but one may assume that the procedure had some effect, since such psychiatric investigations inevitably lead to increased contact through discussion of some of the patient's problems and arrangements for his convalescent period, etc. One would anticipate that more systematic and intensive work along these lines would improve the social results not only in head injuries but in all branches of accident work.

Summary

A series of 300 consecutive admissions of head injuries to an Accident Service in a mixed urban and rural district was investigated in regard to the social effects of the accidents. 4% of the patients died, and two became invalids through cerebral damage. Of the cases 80% were treated in hospital for 14 days or less. The average working time lost by wage-earners was roughly eight weeks. In mild cases (i.e., those with a post-traumatic amnesia of one hour or less) the average loss of working time was 4 to 5 weeks; in moderate cases (post-traumatic amnesia 1 to 24 hours) it was 5 to 6 weeks; in severe cases (post-traumatic amnesia 1 to 7 days) about 9 weeks; and in the severest cases 14 weeks. Eight patients were off work for 26 weeks—two on account of cerebral damage. In patients who stayed off work for an unusually long time, with the exception of the cases of cerebral damage, it could be shown that social and psychological factors were responsible rather than the physical effects of the accidents.

These results emphasize the need for prophylactic management and after-care until the patient has successfully returned to work.

My thanks are due to Prof. H. Cairns and Mr. J. C. Scott for permission to use their case material and for much helpful criticism; to Miss Horder, social worker, for her assistance in the follow-up; and to the Rockefeller Foundation for a grant to support this investigation.

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E. H. Trowbridge and L. Secunda (*New Engl. J. Med.*, 1942, **226**, 195) examined the cerebrospinal fluid in 641 cases of chronic alcoholism admitted to the Boston Psychopathic Hospital between 1929 and 1939, and found that 20% had more than 45 mg. of protein per 100 c.cm. of cerebrospinal fluid. Abnormal protein in the cerebrospinal fluid was more than twice as frequent in chronic alcoholics as in controls. The presence, duration, and number of previous attacks of alcoholic psychosis had no influence on the protein of the c.s.f., and in this connexion, too, the presence of polyneuritis seemed to have no significance.

A CASE OF EVENTRATION OF THE DIAPHRAGM

BY

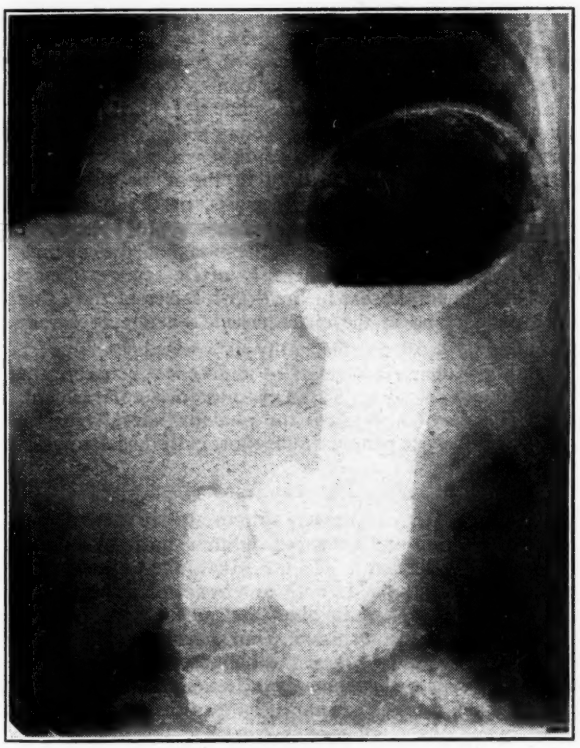
A. J. E. MILLS, M.B., Ch.B.

The condition known as eventration of the diaphragm, although rare, probably occurs more often than is generally believed. There may be no symptoms, and when symptoms are present they may be vague and misleading in character. The degree of disability resulting from the condition varies very much in individual cases. Diagnosis may not be easy. The following case is of considerable interest as illustrating these points.

Case Report

The patient, a man aged 37, is a solicitor. He was first seen by me on Nov. 18, 1941, when he was suffering from an attack of acute nasopharyngitis. A routine examination of the chest, however, revealed quite unusual physical signs, and a day or two elapsed before it was recognized that they were in no way related to his febrile illness.

On examination the thorax was seen to be of normal size and shape. Movement on respiration was diminished on the left side in the lower part. The apex beat was neither visible nor palpable in the normal position. A pulsation, which corresponded in rate to the radial pulse, was felt in the fourth interspace, 2¼ in. to the right of the midsternal line. Normal heart sounds were heard on auscultation over this pulsation. Cardiac dullness extended from 2¼ in. to the right of the midsternal line to 1 in. to the left of the midline, and downward to merge with the liver dullness. The upper border was not elicited with any accuracy. Apart from the abnormal position of the heart, the physical signs on the right side were normal.



Radiograph taken after a barium meal, showing high position of left diaphragm, marked displacement of heart to right, and large bubble of gas in stomach.

On the left side anteriorly, from the level of the fourth rib downward and round into the lowest third of the axilla, the percussion note was tympanitic. In this area the breath sounds were absent, being replaced by splashing and gurgling sounds. Posteriorly, on the left side, the percussion note was impaired from the level of the angle of the scapula downward to the extreme base, where it was again tympanitic. In these areas of impaired resonance and tympany the breath sounds were greatly diminished, the vocal resonance reduced, and the vocal fremitus absent. Elsewhere on the left side, both anteriorly and posteriorly, the percussion note was resonant, the breath sounds vesicular, and the vocal resonance and fremitus normal. The patient had no pain, but complained of a feeling of distension in the lower chest and upper abdomen on the left side.

A radiological examination was made by Dr. George Grant, who reported as follows: "The left diaphragm was much elevated into the thorax and a large collection of gas was seen immediately beneath it. The heart was much displaced to the right and gave almost an appearance of dextrocardia. Investigation on the screen showed that the left half of the diaphragm moved normally with inspiration and expiration, except that the excursion was less."

Further radiological examinations were made on Jan. 19, Feb. 16, and March 7, 1942, and all showed the position of the heart and the left diaphragm to be unchanged. "A barium meal passed down a normal oesophagus without delay and entered what appeared to be an upper loculus of the stomach, lying in the posterior half of the base of the thorax; the contents eventually 'spilled-over' into the lower main part of the stomach, which appeared normal. A lateral view showed the peculiar form of the proximal half of the stomach with much distension. The biloculation appeared to be due to inversion posteriorly of the cardiac end. There was no pyloric stenosis, and passage onwards of the meal was normal. No other abnormality was seen except for the high position of the splenic flexure."

Several clinical examinations were made at subsequent dates up to May 21, and on each occasion the physical signs described were found to be unchanged.

Apart from an attack of "threatened appendicitis" at the age of 12 years and left-sided herpes zoster at 22, the patient has had no illnesses of note. During his school and university careers he regularly took part in long-distance running and hockey, and continued to play hockey until he was 34 years old. He believes that he was always more "short of breath" than most people under the same circumstances, and was unable to play in any game earlier than 3 to 4 hours after his last meal. For as long as he can remember he has often suffered from a feeling of distension in the epigastrium and left hypochondrium. This and frequent paroxysms of severe hiccup have been his chief symptoms. An attack of hiccup often lasts for well over an hour and is only relieved by lying down for a considerable time. The appetite is fairly good, and there is no nausea, vomiting, heartburn, or water-brash. The bowels are regular, evacuation is easy, and the stools are not constipated. He is a teetotaller and a non-smoker. In Feb., 1941, he was passed as Grade I by a medical board for military service.

There can be little doubt that the case is one of eventration of the left side of the diaphragm, and almost certainly of congenital origin.

Discussion

The absence of paradoxical movement excludes the possibility that the condition is due to a paralysis of the left phrenic nerve. Singleton (1937) and Hurst (1941) claim that a diagnosis of congenital eventration of the diaphragm cannot be made in the absence of paradoxical movement. Bayne-Jones (1916), Korns (1921), and Reed and Borden (1935), on the other hand, all agree that the movement on the affected side may be normal, diminished, or paradoxical. In the 6 cases described by Wood and Wood (1931) paradoxical movement was noted in only one.

Increased divergence of the costal margin from the midline on the affected side, due to action of the intercostal muscles unopposed by the weak diaphragm, was seen in this case. This phenomenon has been referred to as Korns's sign, and was stated by Korns (1921) to be diagnostic of eventration in contrast to herniation of the diaphragm. According to Hurst (1939), megacolon is commoner than congenital defect as a cause of high position of the left diaphragm. In the present case neither the clinical findings nor the appearances during administration of a barium enema and after a barium meal were at all suggestive of megacolon. That the condition is one of *aérogastrie bloquée* is unlikely, as acute pain was never present, the clinical and radiological signs did not vary, and the passage of a tube into the stomach was without result.

Of the subjective symptoms present, hiccup was the most prominent in my case. In a search through the relevant literature I have failed to find this mentioned as a symptom of eventration of the diaphragm.

Summary

A case of congenital eventration of the left side of the diaphragm in a man aged 37 is described. Although associated

with marked displacement of the heart, he is able, with certain precautions, to undergo violent exercise, and was placed in Grade I by a medical board. Hiccup is a prominent symptom which has not hitherto been noted in connexion with this condition.

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THE SIGNIFICANCE OF PLEURISY AND PLEURAL EFFUSION IN DIFFERENTIAL DIAGNOSIS

BY

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The assessment of the significance of pleurisy and pleural effusion comes under three main headings of history and physical signs, *x*-ray diagnosis, and laboratory examination of fluid in cases of frank effusion. Only by considering the findings in this order can the physician come to a justifiable decision in any difficult case for differential diagnosis. To place too much reliance on the results of the accessory laboratory and *x*-ray reports without considering them in the light of the fundamental findings of careful history and physical examination may lead to disastrous results for the patient.

History: Temperature

Certain points in the history deserve special attention. The age of the patient can often give an indication of what the physician may expect as the true cause of the condition. At all ages the possibility that the illness is secondary to any primary lesion between pneumonia and new growth must be borne in mind, but there are certain broad lines of direction. Thus, if we are to believe after-histories, the disease is seldom tuberculous under the age of 15. In the age group 15 to 25, however, the diagnosis of tuberculosis must be to the fore: while at its earlier ages many cases are idiopathic, towards its later ages we must be on the look out for underlying lung disease. The probability of such primary tuberculous disease remains in age groups up to 40; over 40, new growth demands increasing consideration.

Examination of the temperature chart can give much assistance. Tuberculous pleurisy and pleural effusion usually cause an acute rise of temperature to the neighbourhood of 102° F., and while in primary idiopathic cases the fall is commonly by steady lysis, that in secondary tuberculous effusion is by interrupted lysis—that is, in a series of peaks of temperature at intervals of 2 or 3 days, each successive peak being slightly lower than its predecessor, and intervening falls being of 1 or 2 degrees. Such a temperature chart is not like that of pleural effusion complicating the case of pneumonia. Here the initial onset temperature round 103° F. is maintained until the crisis brings a fall to a subfebrile rather even level, maintained as long as the fluid is clear, but replaced by swinging variations on the appearance of pus. It is not, however, easy to distinguish such a chart from that of pneumonia complicated by abscess of lung. The charts of effusion in new growth or cardiac and renal failure may show continued subfebrile temperatures, but most show no rise above the normal line.

Pain

The history of pleural pain, with reference to its site and intensity, is almost diagnostic in several instances. The agonizing mid-axillary pain of pneumonia is totally unlike the basal discomfort of the bronchopneumonic. That described as the "growing of wings" between the shoulder-blades, often the first sign of plastic pleurisy in a recently active case of phthisis, is quite different from both the "rheumatic" shoulder ache of healing and healed upper-zone tuberculosis, and the shooting shoulder and upper-arm "neuritis" of diaphragmatic pleurisy. The stabbing posterior axillary pain of acute tuberculous pleurisy—of longer duration than pneumonic pleurisy, and often maintained until effusion is established—should be readily distinguished from the pain of middle-lobe collapse. Here the pain is always anterior, below the mammary line, periodic, and varying in characteristic waves of intensity from discomfort to acute agony. Further, such varying intensity in a confined and usually silent area is in direct contrast with the slightness or absence of pain associated with an extensive pleural rub in abscess of the lung. On the other hand, the limited extent of pleural signs as against the marked extent of dullness in the average bronchiectasic is an interesting comparison with the repeated discomforts and absent or anomalous stethoscopic findings in cystic disease of the bronchi. Epidemic myalgia ("Bornholm disease") shows such variations, and so marked a dissociation between pain and pleural friction in the cases so labelled that it is probably not a true entity but a mixture of two separate conditions, some patients having muscular rheumatism and others abortive lung abscess; moreover, it is diagnosed at seasons when upper sinusitis and antral infections are common.

General Examination

Careful and complete physical examination should be carried out in all cases. The necessity for a general examination cannot be overstressed, for the possibility that chest symptoms and findings are secondary to abdominal disease—e.g., diaphragmatic pleurisy complicating subphrenic abscess—must ever be kept in mind.

The general appearance and facies will repay their study. The anxious look of fear predominates in the pneumonic, and while he may have a flush on one or both cheeks, which is particularly marked with the onset of complications, he never has the appealing look, the clear complexion, and the bright eye of the average tuberculous patient. This is in contradistinction to the muddiness of complexion which is a predominant feature in cases of chronic sepsis, whether the lesion be an encysted purulent effusion in the main pleural sac or in an interlobar fissure, bronchiectasis, or the purulent complications of congenital cystic disease. It appears fairly rapidly in the acute septic complications of the pneumonias such as lung abscess, but here is often accompanied by a look of excitement, absent in the drawn facies of the exhausted cardiac patient and in the characteristic wasting of carcinoma.

If pulmonary osteo-arthropathy is present its type should be noted, as there is a marked difference between that of established phthisis, with its antero-posterior enlargement, and that of sepsis which involves the phalanx laterally as well as antero-posteriorly to produce a diagnostic drumstick appearance.

Physical Signs

Two points are particularly important in actual physical signs: the position and extent of dullness, and any evidence of mediastinal displacement. On the whole, the dullness of established lobar pneumonia is both anterior and posterior, and in intensity is equal, at any involved area in the lung, between the periphery and the mediastinum. That of collapsed lower lobe is first completely posterior; as the collapse progresses, the dullness diminishes in extent towards the inner third, while the outer zones become more and more tympanitic by compensatory emphysema. When collapse is complete the dullness is confined to the anterior cardio-phrenic angle. Such a finding is in direct contradistinction to the bilateral areas of dullness confined to the costo-phrenic angles in pleural effusion complicating cardiac failure, and should not be confused with either the outer-half dullness of established tuberculous pleural effusion or the anterior lower-zone dullness of a collapsing middle lobe.

The "sterno-mastoid sign" is the easiest method of diagnosing mediastinal displacement, as tension of one muscle will demonstrate the pushing or pulling of the mediastinum to the same side as the tension. The sign is a valuable correlation with the position of the apex beat, the displacement of which means that there is a lesion on one side of the chest which

is either confined to the lower zone or involves all three zones of the lung. Upper-zone disease alone seldom moves the apex beat. An actual example of the application of these findings may be given in the diagnosis of fluid complicating right lower-lobe collapse. Immediately collapse begins, the sterno-mastoid on the same side becomes tense. As collapse increases, the apex beat moves to the right. Should fluid supervene on the collapsing lobe the position of the apex beat will not be an aid in itself; it will often remain within normal limits as the result of two opposing forces. The sterno-mastoid sign, however, remains positive on the right side and will therefore be direct evidence that the case is one of secondary and not of primary pleural effusion.

X-ray Examination

The examination of *x*-ray films of pleural effusion requires specialized knowledge. Unfortunately it has become accepted in many textbooks that the radiograph of frank pleural effusion is recognized by a curved line showing a concavity downwards and inwards from the axilla to the diaphragm. It is possible that to wait for such a confirmatory line may postpone necessary treatment and diagnostic pleural puncture to a late stage. Fluid first accumulates in the posterior diaphragmatic angle, and from the beginning seems to be associated with an area of fine equal loss of translucency in the costo-phrenic angle of the affected side. Examination of several cases seen at this early stage appears to lead to the conclusion that this shadow is at first due on the right side to a relaxation of the diaphragm and a rise of the liver. The differential diagnosis of the shadow of established effusion, as against that of pneumonia, is that while pleural effusion shows loss of translucency increasing in density from the periphery to the middle zone, the shadow of established lobar pneumonia is equal in density at any one level between the periphery and the mediastinum. Moreover, the fact that pneumonia does not displace the mediastinum is a distinct aid.

The changing density of shadow in pleural effusion is due in the majority of cases to pressure-collapse of the lung; the establishment of a definite linear curve means only that already there is some organization of the visceral pleura. The midzone density may of course be due to underlying disease of the lung. In both cases withdrawal of fluid, even if accompanied by air replacement, is not always helpful to final diagnosis, as all that may occur is that the fluid remains over the collapsed or diseased area, to produce a shadow this time convex in outline as against its previous concavity.

The case of suspected interlobar effusion should always have the benefit of a lateral radiograph, and it often pays to carry out a lordotic examination at the same time.

The main difficulties in the differential diagnosis of interlobar effusion are connected with shadows in the region of the right upper interlobar fissure. Here the physician may have to consider the possibilities of pneumonia affecting one branch of the bronchus, tuberculous pneumonia, and bronchial carcinoma. While pneumonia in its later stages of non-resolution may produce a concavity upwards of the interlobar fissure, the uncomplicated case seldom shows a well-defined line. Tuberculous pneumonia usually has its most marked density of shadow above the middle third of the raised interlobar fissure. New growth has similar increased density of the inner third. Involvement of one branch of the bronchus by pneumonia gives an inner or outer third increase of density according as to whether the infection is in the axillary or the pectoral branch; it is not confined to the interlobar fissure, but extends well into the lung substance. In all such chronic conditions the upward concavity in the interlobar fissure is due to shrinkage-collapse of the affected lobe and compensatory emphysema of the underlying lobes. An added help in the radiograph is that whereas tuberculous pneumonia from its start, and bronchial carcinoma in its later stages, show mediastinal displacement to the affected side, uncomplicated pneumonia shows a central mediastinum. Interlobar fluid, if it does cause displacement, will show it to the side opposite from the lesion until the effusion becomes encysted and, in drying, produces fibrosis. Again, where fluid is present the underlying compensatory emphysema is no longer evident: the well-defined interlobar fissure becomes a straight line or shows a convexity as against its previous concavity.

The shadow of middle-lobe collapse is so different as to be usually diagnostic, especially in the lateral view. The antero-posterior view has two specific findings. The first is that the shadows in the lower midzone are lateral in formation as against the usual downward and outward distribution of lower-lobe bronchopneumonia. The second is that there is almost always an area of translucency between the raised diaphragm and these lateral shadows. The lateral radiograph may be completely diagnostic in itself, in that it shows a typical triangular formation, the upper apex of the triangle lying at the junction of the upper two-thirds and the lower third of the mediastinum, the upper outer side of the triangle going outwards towards the fourth rib in the axilla, and the inner lower side passing downwards and inwards towards the middle of the raised diaphragm.

Difficulty is often encountered in the differential diagnosis of middle-lobe collapse or fibrosis on the one hand and mediastinal or mediastino-interlobar effusion on the other, by faulty positioning of a patient who has to be radiographed by portable apparatus while in bed. Often a semi-lordotic film is produced, giving a confused picture of the mediastinum and a squat shadow of the heart, and it may be necessary to support the patient in bed to get good antero-posterior and lordotic pictures before final diagnosis is made.

Idiopathic diaphragmatic pleurisy does not show any involvement of lung or diaphragm in radiographs. A secondary diaphragmatic pleurisy is common in abdominal disease, and in particular in subphrenic abscess. The effusion tends to be localized, and in most cases shows in the antero-posterior picture as a loss of translucency which sits above the line of the diaphragm, with a density little less than that of the underlying congested liver.

The radiograph of the transudates of cardiac and renal failure generally shows bilateral effusion, small in extent, and confined to the costo-phrenic angles.

Examination of the Fluid

It does not seem to be generally recognized that it is of primary importance to accompany the examination of pleural fluid with a complete blood count. This is as important as the general examination of the patient, as it is quite possible that an underlying primary disease, either lung or abdominal, may be missed in all good faith. For example, the finding of a predominant leucocytosis in the blood film is as important as the presence of excess polymorphs in an effusion which is going on to empyema. A diaphragmatic effusion in its early stages may be read as tuberculous in origin, whereas the true underlying condition may be subphrenic abscess.

In general, it may be stated that it does not follow that an effusion in a known tuberculous case is necessarily tuberculous; difficulties have been encountered in cases in which the true primary cause has been shown later to be cardiac failure. Another general point that requires emphasis is that no effusion should be considered as blood unless such blood is evident to the naked eye. In the examination, therefore, it is always necessary that the pathologist should compare the actual incidence of leucocytes and of true red cells in the sample submitted. Further, it does not follow because there is blood to the naked eye that the underlying condition is necessarily new growth; it may be acute tuberculosis.

The appearance of the fluid can be of much help. A clear odourless yellowish fluid is found in both exudates and transudates, but the tuberculous exudate clots more readily, has a higher specific gravity, and usually contains protein of more than 4 mg. per c.cm. Its cell count shows excess of small lymphocytes. An excess of endothelial cells is common in transudates and in obstruction to the circulation; it may suggest new growth, but is not diagnostic. Excess eosinophils are common in hydatid cyst which has been mistaken for pleural effusion. It is said that if they occur in a post-pneumonic effusion the prognosis is likely to be good, in that the patient will not go on to empyema.

The bacteriology of tuberculous fluid can be very misleading if the proper time for examination is not chosen. Fluid withdrawn at the onset of tuberculous effusion will usually be entirely negative to both culture and guinea-pig inoculation, and if this finding is taken as conclusive the result to the patient may be serious.

Cloudy fluid is common in streptococcal infections. Chylous effusion is usually opaque and must make the physician think of chronic tuberculosis or endothelioma of the pleura. It is exceedingly common in injury to the left subclavian vein or the main thoracic duct. Purulent effusions which are odourless are as a rule thin in the early stages. Tuberculous septic pyothorax usually gives a greenish-yellow purulent fluid. Where the effusion is offensive, the observer must immediately suspect the presence of lung or bowel communication with the pleural cavity, and his mind will run on a differential diagnosis for the primary lesion as between abscess of lung, bronchiectasis, empyema with broncho-pleural fistula, and pus in the abdomen, where subphrenic abscess is by far the commonest finding.

TRANSUTERINE INSUFFLATION AND SALPINGOGRAPHY

BY

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The usual methods of uterine and tubal insufflation, whether by gas or by radio-opaque substances, are somewhat tedious to carry out, and their use often involves a certain amount of physical as well as psychological trauma to the patient. The following method, in which a simplified type of cannula is used, was evolved by me some twelve months ago, and has proved to be satisfactory either for gas-insufflation in the consulting-room or for injection of radio-opaque fluid in the *x*-ray department or operating theatre.

The Apparatus

The insufflation cannula (Figs. 1 and 2, B) consists of a hollow metal tube with a conical, rather sharp, screw-tip; this can be screwed into the cervical canal tightly enough to prevent leakage around it. At first sight this might seem a traumatic procedure; but repeated examinations made after its use have failed to show that any damage has been inflicted on the cervix, nor is the process of insertion and screwing-in attended with more than very minor discomfort. The proximal

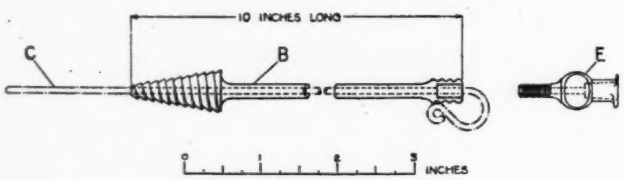

FIG. 1

end of the tube is expanded so that a rubber tube can be slipped on to it from the ordinary CO_2 or air-insufflator apparatus, and into this same end can be screwed, if lipiodol is to be used, an adapter with bayonet-fitting to take any standard S.I.M.A. syringe (Fig. 1, E). The cannula also has a stylet (Figs. 1 and 2, C), which reaches about three-quarters of an inch beyond the distal end. The purpose of this is to guide the cannula into the cervical canal, from which it is automatically extruded during the process of screwing-in.

Method of Use.—The patient lies in the left lateral or the lithotomy position. A narrow, warmed and lubricated Fergusson's speculum with obturator (Fig. 2, A) is passed and the obturator withdrawn. Illumination is provided by angle-poise lamp or headlamp, and when the os presents it is mopped dry and cleaned with a suitable antiseptic; for this purpose I have found it convenient to use cotton-wool swabs held in Desjardins' gall-stone forceps (Fig. 2, D). The speculum is steadied with the left hand, and the cannula, armed with its stylet, is passed with the right hand. The stylet, guiding the tip of the screw-cone through the external os into the cervical canal, is now loosened, and the cannula is screwed home gently but firmly; the stylet is now removed and the speculum may also be withdrawn. If the patient is in the left lateral position she is now asked to turn on to her back; meanwhile the cannula is simply steadied by the operator, for it will not disengage itself. The gas or lipiodol connexion

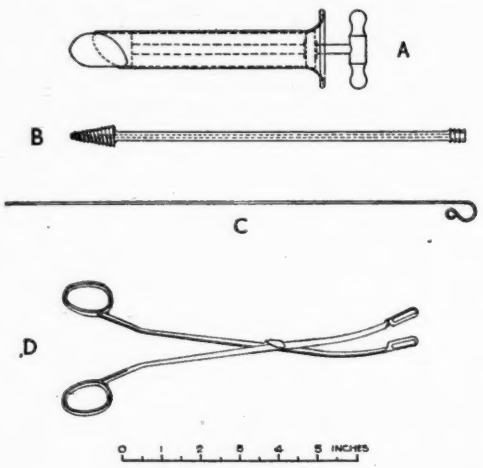

FIG. 2

is now fitted at the distal end of the cannula, and the routine insufflation carried out with the minimum of assistance and fuss.

Comment

1. It is claimed that this method has the merit of simplicity.
2. An air- and oil-tight connexion is ensured, and hence leakage, which may produce false impressions, is avoided.
3. The use of vulsella, which are painful and traumatic when applied to the cervix, is rendered unnecessary. This is particularly valuable, since distortion of the uterus and appendages by traction and countertraction is avoided. Indeed, the cervix can actually be pulled down during insufflation or injection, if desired.
4. During the process of "screwing home" the patient may complain of some pain; this is usually slight, and ceases as soon as the screw is fixed in the cervix.

The cannula was originally made for me by Mr. A. E. Christmas of Frome, to whom I am greatly indebted for many helpful suggestions, and is now being manufactured and marketed by Messrs. Down Bros. Ltd.

THE PITRESSIN DIAGNOSIS OF IDIOPATHIC EPILEPSY

BY

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As a rule in hospital practice there is little urgency for a rapid diagnosis to be made in cases of suspected idiopathic epilepsy, and doubtful cases can be submitted to prolonged observation until an actual seizure has taken place. There are, however, certain occasions when it is necessary to establish a definite diagnosis as early as possible. In the average hospital case the required period of observation will be a matter of days or at the most a week or so, but when irregular seizures occur at infrequent intervals this period may have to be extended into months before a definite diagnosis can be established. It is with a view to curtailing this period of observation that an attempt has been made to determine a method whereby the condition can be diagnosed with a degree of certainty in the absence of seizures.

Indications for Use of the Method

The circumstances under which it may be necessary to give a rapid opinion on the existence or otherwise of this condition

will, of necessity, vary according to the requirements of the individual case, but the following are indications in which the method has been found to be of value.

1. In order to differentiate between idiopathic epilepsy and hystero-epilepsy.

2. Where the existence of idiopathic epilepsy has been claimed by a patient in the absence of clinical evidence and a definite diagnosis has to be established.

3. When a diagnosis has to be made in a case where the history and clinical features are suggestive of the presence of idiopathic epilepsy, the existence of which is denied by the patient, and where a seizure has not resulted.

4. Where a diagnosis has to be established as a result of various conduct abnormalities being attributed by the patient to the existence of idiopathic epilepsy, and where a seizure has not resulted.

5. Where a differential diagnosis has to be made between idiopathic epilepsy and malingering.

6. Where, under any of the foregoing indications, there is an added urgency for legal reasons, and where time does not suffice for the usual method of continued observation by a trained nurse until an actual seizure ensues.

At present these various indications are often encountered in the routine examination and assessment of Service cases, and the importance of reducing the period of observation necessary, with the resultant economy in time, expenditure, and man-power, as well as the greater accuracy afforded in diagnosis, can be readily appreciated.

Relation of Water Balance to Idiopathic Epilepsy

The rationale of the method adopted depends upon the fact that retention of water in the body will precipitate a seizure in predisposed persons while exerting little influence on normal individuals. In 1931 McQuarrie, studying the effects of prolonged pituitary antidiuresis combined with increased fluid intake on young epileptics, found that seizures resulted in predisposed subjects but not in others. Working along similar lines, Temple Fay found that abnormalities in water metabolism were an important predisposing factor in the production of idiopathic epilepsy. Similar investigations have been carried out by Jacobsen, and later by Clegg and Thorpe, who have made exhaustive studies on the relation between the water balance of the body and the occurrence of epileptic seizures. Clinically, the frequency with which distension of the subarachnoid space is demonstrable in epileptic subjects either by means of operative procedure or by encephalography is of importance, while various observers have stressed the efficacy of hydragogue cathartics in the reduction or averting of seizures without associating this finding with the water balance of the body, but rather attributing the beneficial results obtained to the removal of toxic substances.

The establishment of a positive water balance in a selected subject can be obtained by the prolonged ingestion of copious amounts of water alone, but this method requires the expenditure of a considerable amount of time and often leads to lack of co-operation on the part of the patient and, in some cases, to actual refusal to continue to submit to investigation. More rapid results are obtained by the oral administration of copious amounts of water accompanied by pitressin intramuscularly. This is the pressor and antidiuretic principle of the posterior lobe of the pituitary, as distinct from the oxytocic. This substance has the property of causing marked water retention in normal individuals while having the subsidiary effects of stimulating the involuntary muscle of the gastro-intestinal and genito-urinary tracts and slowing the pulse.

Experiments with anaesthetized animals have shown that pitressin, even in small doses, produces a temporary polyuria followed by a reduction in output which in time amounts to an almost complete stoppage of flow. In non-anaesthetized dogs the antidiuretic effect is well marked, and this is also the predominant effect in the human subject. The action of pitressin in causing water retention in a normal subject is demonstrated in the accompanying chart. A is the normal curve, showing the accumulative excretion of urine resulting from the ingestion of 1,000 c.cm. of water at 8 a.m. The curve reaches its zenith after the expiry of 5 to 6 hours, and remains at a fairly constant level thereafter. B shows the effect produced by injections of 1 c.cm. of pitressin under similar conditions. C and D show the effect produced by injections of 2 c.cm. and 3 c.cm. of pitressin respectively. It will be seen that even in small doses this substance has a well-marked antidiuretic effect on the human subject.

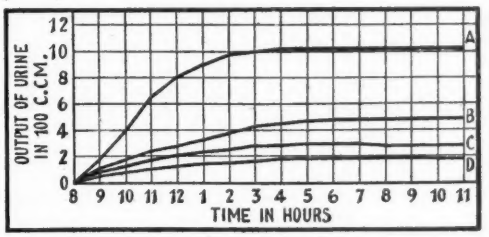

Chart showing the water-retaining action of pitressin in a normal subject.

A Preliminary Test

Because ~~On account~~ of the physiological properties of pitressin there are certain contraindications to its employment in diagnosis. These are mainly the presence of diabetes, nephritis, arteriosclerosis, and myocarditis, and before starting the investigation it is advisable to eliminate the existence of these conditions by a routine urinary examination, an estimation of the blood pressure, and a cardiovascular examination. The test adopted was carried out in the following manner.

The patient under investigation was confined to bed throughout the test. The bowels were opened by an enema, urine was voided, and his weight was then taken. Ordinary diet was maintained throughout; any previous sedative therapy was discontinued, and he was encouraged to drink copious amounts of fluids. The intake and output of fluid were charted daily, while the patient was weighed morning and evening. An increase of 2% in the body weight with the ingestion showing an excess over the excretion was accepted as evidence that a positive water balance had been established (earlier investigators stressed the importance of there being a 3 to 6% increase, but this standard was abandoned in the early stages of the present investigation as the period necessary to obtain this additional increase defeated the purpose of the test.) The average period required for the establishment of this balance with a co-operative patient carefully supervised was 48 hours. Throughout the investigation known non-susceptible patients were used as controls. When a satisfactory water balance had been attained, 0.25 c.cm. of pitressin was injected intramuscularly and 300 c.cm. of water was administered orally. Thereafter 0.5 c.cm. of pitressin was injected and 300 c.cm. of water given orally every two hours to a total of 10 injections. On the occurrence of a seizure the treatment was immediately stopped, but otherwise the full course was given. In every case pallor followed the administration of pitressin within 5 minutes of the injection, and lasted on an average for 3 hours, disappearing after the second or third injection, but in a few cases this continued at a uniform level throughout the investigation. The physiological action of the drug was displayed by the slowing of the pulse and the tendency to looseness of the bowels, but these features were in no instance severe enough to merit termination of the investigation.

The positive evidence that idiopathic epilepsy is present depends upon the development of an actual seizure, which may be of either the major or the minor type. The failure to produce such a result does not necessarily prove that the patient is non-susceptible, and in doubtful cases the test may have to be repeated before an opinion can be given. The seizure in susceptible cases has been found to result most frequently after the fifth or sixth injection—that is, a period of 8 to 10 hours—but in certain cases this may be delayed until after the tenth or final injection, while in others a positive result may be obtained in the initial stages after the first injection.

The combination of the establishment of a positive water balance and administration of pitressin appears to be a necessary factor in the production of the seizure, as cases treated with pitressin alone without previous adjustment of the water balance failed to react, while no result was obtained in those cases in which a positive water balance alone was established. The control cases, which were previously known to be non-susceptible, displayed the physiological signs of pallor, slowness

of pulse, and looseness of the bowels, but in no instance did a seizure of either type ensue. This specific action enabled the differential diagnosis between the idiopathic and hysterical types to be readily made without having recourse to a period of prolonged observation.

The above test was carried out on 87 cases in which it was desired either to establish or to eliminate the possibility of the presence of idiopathic epilepsy. The following Tables summarize the results obtained.

TABLE I.—*Results in Cases in which Presence of Idiopathic Epilepsy was Suspected from the History or Clinical Features but Existence of which was Denied by Patient*

Cases treated	49
Positive results	45
Failure to react	1
No. stopped	3
Test result verified by subsequent history	39

TABLE II.—*Results in Cases in which Presence of Idiopathic Epilepsy was claimed by Patient in Absence of Supporting Clinical Evidence*

Cases treated	38
Positive results	8
Failure to react	28
No. stopped	2
Test results verified by subsequent history	7

TABLE III.—*Results showing Position in Course of Test at which Seizure Resulted*

Cases Treated	Positive Results	No. of Pitressin Injection									
		1	2	3	4	5	6	7	8	9	10
87	53	2	1	2	4	19	17	0	0	2	6

In every case the patient was kept in hospital under observation for a period of one month after the termination of the investigation for the purpose of obtaining corroborative evidence, or until such time as a seizure resulted if this period was less than one month. In those cases in which no evidence was available at the expiry of this period the patient was discharged and the subsequent medical history was followed up through the medium of the family doctor.

The above Tables show that only 1 out of 49 susceptible cases failed to react, and that of the 45 cases which gave a positive reaction 39 (86.6%) were later found to furnish corroborative evidence of the accuracy of the test. In the second group, positive evidence was afforded by means of the test at the expiry of 72 hours in 8 cases, which would otherwise have required a prolonged period of observation; of these 8 cases 7 later furnished corroborative evidence in the light of the subsequent history. In only one case of the series did a positive water balance fail to be established and result in ending the investigation, while 2 cases had to be terminated on account of the nausea which persisted in spite of various forms of treatment. Three cases had to be terminated, on account of non-medical factors associated with home circumstances, before any definite result could be obtained.

These findings are in keeping with Jacobsen's original investigation of 40 patients, mostly children and known epileptics, in whom a seizure was induced in every case by the use of pitressin after the water balance had been satisfactorily established. Clegg and Thorpe, under similar conditions, obtained positive evidence in a group of 16 adult epileptics.

As experimental water intoxication in animals results in the onset of convulsive seizures and vomiting, and although epileptic phenomena can be more readily produced in animals than in man, it is reasonable to deduce that some relation exists between the water balance of the body and the onset of the actual seizure. The epileptic's nervous system appears to be unstable and easily influenced by minute changes in the osmotic pressure of the body fluids. As water retention is accompanied by a lowering of the osmotic pressure of the blood serum it is considered that the factor precipitating the actual seizure is the resultant exudation of fluid into the intratrabecular spaces, which are loosely supported, and that subsequent to the seizure the osmotic pressure of the blood serum returns to its normal level. The specific *modus operandi* of the antidiuretic effect of pitressin is not yet fully understood, but water elimination is probably retarded by a change in the permeability of the cell membrane and the establishment of a new balance between water loss and water concentration. Whether the precipitating factor is controlled or influenced by psychological, dietetic, allergic, endocrinic, or other factors has not as yet been ascertained, and further work along parallel lines will be required before a definite statement can be made as to the actual cause of the seizure. This finding has been claimed to be of therapeutic value by certain observers, who state that beneficial effects follow the use of a diet with a minimum fluid intake. To be effective, however, the course of treatment must be prolonged over a number of years, and this is apt to cause the patient a degree of distress, with a consequent discontinuance of the routine.

Summary and Conclusion

A method of investigation suitable for use in cases of suspected idiopathic epilepsy has been advanced. The method has been found to possess the advantage of enabling a fairly accurate opinion to be given in a short time. In the average case this period will be 72 hours, consisting of 48 hours for the establishment of a positive water balance and a maximum period of 24 hours for the actual investigation. The advantage of this in the grading of Service cases at the present time can be appreciated, while it offers certain economic advantages to hospitals and out-patient centres.

The accuracy of diagnosis as verified by a subsequent follow-up of cases has been placed at 86.6%, after a prolonged investigation of 87 unselected cases of average adult age.

The method possesses the advantage of simplicity in application and interpretation of results. The period of observation is reduced to a minimum, and the method need only be subsequently utilized in cases in which a positive result has not been obtained at the end of the period.

A suggestion as to the mode of producing the actual seizure has been advanced and further lines of investigation have been indicated.

ADDENDUM.—For some years past it has been recognized that the electro-encephalograph furnishes a ready and accurate means of diagnosing the presence of idiopathic epilepsy on account of the abnormal waves which are met with in these cases. While it is not suggested that the method outlined above should replace that of electro-encephalography, it affords an accurate gauge and may be utilized by all classes of practitioner, to many of whom the facilities afforded by the former method are not readily available.

Medical Memoranda

Diphtheria during Immunization

At the present time, when so many children are being immunized, the following case is of some interest.

CASE RECORD

A child aged 5 was inoculated with the first dose—0.2 c.cm.—of diphtheria prophylactic. She was a perfectly healthy child and had had no previous illness of any significance. The inoculation was done with the usual aseptic precautions, and the phial was well shaken in order to mix the contents thoroughly. The inoculum used was alum-precipitated toxoid (A.P.T.). This preparation was chosen because it is particularly useful in children under 8 years; it provides a high degree of immunity, and reactions from it are rare; in older children and adults reactions may be somewhat severe.

In this case, as in many others of the same age, there was no local or general reaction to the inoculation. In the third week following the first injection the patient was seen again on account of general malaise and listlessness. She was inclined to lie down and sleep, complained of a feeling of nausea, and appeared to be generally "out of sorts." On examination there were no physical signs in any system and no symptoms apart from a furred tongue; the throat was clear. The mother remarked that the child appeared to be "sickening for something," as indeed she was. She was confined to bed and given a light kind of diet and drinks, and a simple sodium bicarbonate mixture.

In two days she developed what appeared to be an acute follicular tonsillitis, with a few punctate septic spots on both tonsils. The tongue was dry and furred, she complained of thirst, and had vomited occasionally. The temperature was raised to 103.5°, the pulse was rapid, the face flushed, and she presented the usual general febrile condition. In the course of routine examination of all systems the knee-jerks (which are often absent in early diphtheria) were present. The urine was albumin-free. In the treatment advised, milk drinks were curtailed (in order to lessen the amount of methionine, which inhibits the bacteriostatic action of sulphonamides), and streptocide was prescribed—half a tablet (0.25 g.) three-hourly. The following day the patient was very much improved; she was much brighter and was sitting up in bed, the temperature had fallen to 99°, and symptoms generally had abated. The throat had cleared considerably except for a small patch on the left tonsil about 1/8 in. in diameter.

Both tonsils had been swabbed, purely as a matter of precaution; a negative swab was not anticipated owing to (*a*) the absence of a definite or suspicious membrane, (*b*) the fact that the knee-jerks were present, (*c*) the typical sharp rise of temperature suggesting an acute streptococcal throat infection. A positive result for K.L.B., however, was notified from the laboratory; by then the patient was sprightly and apparently fairly well.

COMMENT

The phenomenon of diphtheria following shortly after the first stage of immunization would lead one to consider whether administration of toxoid activates any dormant infection such as that of a carrier at the time of inoculation. One suggestion may be that there is a greater susceptibility to infection—the so-called "negative phase" following inoculation—and that a dormant bacillus, whether virulent or avirulent, may be activated indirectly or assume a comparatively virulent form in an organism of lowered resistance, producing toxic symptoms. There is thus good ground for indicating that a valuable procedure would be to swab all throats before inoculation and administer antitoxin until one obtains negative swabs—at least, in those cases in which virulence tests demonstrate a "gravis" type. Adoption of this routine would be of more value than Schick-testing, which, as suggested by Leete (*B.M.J.*, 1942, **2**, 121), can be dispensed with provided one intends ultimately to immunize with a reliable antigen.

In this particular case the streptococcal infection was evidently cleared by streptocide, and it is probable that the streptococci enhanced the virulence of K.L.B. in a mixed infection.

Liverpool. G. A. GARRETT, M.B.

Removal of Filaria Worm from Eye

The following case may be rare enough in this country to merit description.

I was asked recently in the mess by a middle-aged officer who had spent a considerable period of his life in Nigeria if I knew anything about tropical diseases. Upon my saying that I had them all at my finger-tips, he asked without further preamble, "Then can you take a filaria out of my eye, Doc.?" I decided either that he was suffering from delusions brought on by too much probing into textbooks or that if he spoke the truth my assumption of knowledge had been rather too glib. However, a short examination showed a marked injection of the conjunctiva of his right eye, with a worm wriggling underneath towards the outer canthus.

We went to sick quarters, only about five minutes' walk, but by that time the worm had disappeared. It was decided to wait, and in half an hour it had come into view again in the fornix of the lower sac. The eye was cocainized, and, in the absence of ophthalmic instruments, the worm was removed with dental tweezers through a small hole made with a bistoury, the patient applying vigorous traction to the lower lid himself. He made an uninterrupted recovery from this major operation, except for some bruising of the lower lid from his own enthusiastic co-operation.

The worm was 32 mm. long on measurement. Microscopically it was identical with the textbook description of the female worm of *Loa loa*, except that the fully grown female is described as being 50 to 70 mm. long.

The history leaves little doubt that this was a *Loa loa* infestation, although the patient had been four years in this country since serving in Nigeria. Whilst there he twice had worms removed from his right eye, and once suffered from typical "Calabar swellings" on his wrist. He never suffered any other ill effects between the appearance of these worms, and had been perfectly fit since his return to this country. He does not remember the original bite, presumably by a mango-fly.

My thanks are due to Dr. Skeoch of the County Laboratory for his interest and co-operation.

M. C. T. REILLY, M.B.,
Squadron Leader, R.A.F.V.R.

Reviews

SURGICAL CARE BEFORE AND AFTER OPERATION

Surgical Care. A Handbook of Pre- and Post-Operative Treatment. By R. W. Raven, F.R.C.S., Major, R.A.M.C. (Pp. 271. 10s. 6d.) London: Edward Arnold and Co. 1942.

Since the war began there has been almost a spate of textbooks on pre- and post-operative treatment. The most recent wanders rather widely from the course which its title might lead us to expect; thus, opening it at random, we find a micrograph of a tubercle, a reproduction of an *x*-ray film of tuberculous disease of the hip, and then four consecutive illustrations of syphilitic lesions, all of which might seem a little wide of pre- and post-operative treatment. There is, however, much useful advice on the care of surgical patients. Some of the author's statements will not be acceptable to all. It would seem a little unnecessary, perhaps even a little harsh, to prevent patients operated upon for toxic goitre from seeing any visitors for as long as three days afterwards. Some chapters are short descriptions of the subject with but brief reference to pre- and post-operative care: thus Chapter 19, on hernia, has six pages on the different varieties of hernia and their treatment, on the complications of hernia, and illustrations of trusses; and but a few lines on pre- and post-operative care relating to radical cure and to strangulation. Not only does the author of this little book skim adroitly over the field of general surgery, but he enters the specialties, with chapters on eye, ear, nose, and throat operations, on anaesthetics, and on gynaecology. The author's hope, expressed in the preface, that the book will be helpful to "all who are engaged in the management of the surgical patient, both nursing and surgical," is perhaps somewhat ambitious, as the book would appear to be too advanced for the one and perhaps rather elementary for the other, while the medical student is already well provided with handbooks of everyday surgery to use in connexion with his larger textbooks. The best and most useful chapters are those on wounds, shock, transfusion and infusion, and oxygen administration.

TWO BOOKS ON PSYCHOLOGY

Psychiatry in Medical Education. By Franklin G. Ebaugh, M.D., and Charles A. Rymer, M.D. (Pp. 619. $3.50 or 20s.) New York: The Commonwealth Fund; London: Oxford University Press. 1942.

Psychology for Individual Education. By Lois Barclay Murphy, Eugene Lerner, Jane Judge, and Madeleine Grant. Edited by Esther Raushenbush. (Pp. 306. 18s. 6d.) New York: Columbia University Press; London: Oxford University Press. 1942.

These two books from America both deal with psychology but are in interesting contrast in method and purport. Prof. Ebaugh and Dr. Rymer in their *Psychiatry in Medical Education* look at the subject from the professional point of view, and their study is based on a wide survey of the methods practised in many medical schools. It must be remembered that in America the word "psychiatry" includes all that was formerly grouped as medical psychology, whereas in England it is still restricted by many to the treatment of definite psychoses. The authors quote Abraham Flexner's dictum, "The medical curriculum cannot aim at producing physicians ready for practice; it can at best so train the student that experience will in time mature and equip him"—a fundamental truth that is too often forgotten in medical education. They refer to the need for some standard of selection of students suited for a medical career: a subject which will inevitably demand attention if the overcrowding of the schools continues. Moreover, at present many of these fall by the wayside, whether through disinclination or incapacity. The authors make the significant point that the teaching ability of a man is rarely considered in making appointments, and is usually unknown by his colleagues though it is accurately assessed by his students. Some courses are even given by men who themselves fail to grasp the fundamental ideas of psychiatry. As to the syllabus, they agree with H. A. Murray that academic psychology has contributed practically nothing to the knowledge of human nature and is, therefore, useless in medical education. With Prince they feel that what is wanted at the pre-clinical stage is an explanation of the mechanisms that determine mental processes.

This should come immediately after the anatomy and physiology of the nervous system; psychopathology should come at the clinical stage, just before psychiatry. The difficulty of teaching this in clinical classes is recognized because of "the danger of unwarranted intrusion on the privacy of the individual." The postgraduate training of specialists depends on the requirements of the American Board of Psychiatry and Neurology. The authors regard the dominance of the organic point of view as interfering with the recognition of the place of psychiatry in the medical curriculum. Either medicine itself must assume the burden of the teaching of psychosomatic medicine or psychiatry must focus increasing attention upon this aspect. The interrelations of psychiatry with other major divisions of the curriculum are so important that they should dominate psychiatric teaching and practice. The entire instruction might well be centred round the study of man as a whole.

Psychology for Individual Education, on the other hand, describes the course for amateurs given at the Sarah Lawrence College for Girls. Only about half the students anticipate taking up social work as such, while the remainder appear to take the course for light on their personal problems or as a subject of general culture. It is an interesting experiment, but there is the danger that it might lead only to journalistic chatter about matters of personal interest instead of to a scientific and experimental treatment of the subject. It is difficult to judge how far this danger has been avoided without having more details of what is actually taught, but it seems that the dangers were recognized by the lecturers, who were doing their best to avoid them. Thus the only male lecturer who contributes to these pages says, "It is not [the teacher's] function to probe into or attempt to treat the student's emotional problems." This does not quite harmonize, however, with the description given by another lecturer of the emotional reactions excited in the girls by the dissection of a pregnant guinea-pig. One girl, who asked for books which would help her to understand her brothers' annoying behaviour and perhaps do something about it, might have benefited from the parable of the beam and the mote, but she seems to have been dealt with wisely. However, the effect of the course on another girl was to make her "wonder whether there are people who do have good mental health." A discouraging result. No one can doubt the energy, sincerity, and conscientiousness with which these girls were psychologically vivisected, but we are left wondering whether some adolescent characteristics do not mature best away from the glare of the searchlight and the inquisitive microscope. An interesting experiment, we repeat, but one which we should hesitate to advocate in this country until there are more results on which to form a judgment.

SIR PATRICK DUN'S HOSPITAL, DUBLIN

A Short History of Sir Patrick Dun's Hospital. By Thomas Gillman Moorhead, M.D., F.R.C.P.&I., LL.D. (Pp. 228. 7s. 6d. plus 6d. postage.) Dublin: Hodges, Figgis and Co.

The distinguished Regius Professor of Physic in the University of Dublin has never allowed any physical disability to curb his manifold activities, and so with characteristic energy he has produced a well-documented history of Sir Patrick Dun's Hospital, which is timely in view of the probable impending amalgamation with other institutions. Sir Patrick Dun was President of the Royal College of Physicians of Ireland at frequent intervals from 1681 to 1706, and accompanied William III to the Battle of the Boyne. He left his estate, subject to his widow's life interest, to the establishment of a professorship of physic, but as the estate increased in value his bequest was sequestrated for the building of a hospital, the foundation-stone of which was laid in 1803. But funds sufficient for one and ultimately for three professorships were inadequate to maintain a hospital; moreover, as it was built primarily with the object of providing clinical instruction for the students of Trinity College, it made no direct appeal to the charitable public. Thus it remained in financial difficulties until it received £176,580 from the National Sweepstakes. Even when the hospital was built its site was not attractive—on marshy land bordering a canal, which provided many intoxicated, half-drowned patients. Nevertheless, good work was done there; it was a great epoch in Dublin clinical medicine, and men such as Graves and Stokes served on its staff in earlier days, while the clinical teaching of J. M. Purser from 1874 to 1901 made a profound impression on medical thought throughout Ireland. For a short time the distinguished anatomist Alexander Macalister was on the staff. Nor must we omit reference to the work of Miss Huxley in establishing a school of nursing there.

It is unfortunate that the history of the hospital should be marred by so many quarrels, which were carried out with true Irish zest and presumably contributed more to the satisfaction of the antagonists than to the efficiency of the institution. Once again Prof. Moorhead has shown the width of his interests and sympathies, and we must thank him for this admirable footnote to the history of medical education.

Notes on Books

Dr. GEOFFREY BOURNE strikes the keynote of his book, *Return to Reason: An Essay in Political Diagnosis,* in the frontispiece—a diagrammatic cross-section of the brain of a gorilla and that of a man. Here we see the areas for emotional expression are almost identical, while those governing rational processes are very different. His whole plea is for cultivating the latter rather than the former, while admitting the difficulty of restricting emotional reactions to their proper sphere. Indeed, he illustrates the difficulty by his own emotional attack on politicians. That they are often too amateur in their approach to the problems they meet is unfortunately true; but many have served an apprenticeship in local affairs, and whatever their defects his conclusions are too sweeping. Nor are we impressed with his suggestion that only university graduates should be allowed to stand for Parliament; for we have known graduates who—— But we will not pursue that line of thought, merely recalling Lord Baldwin's plea that the politician's function is to tell the expert just what the public will not stand for. Nevertheless, Dr. Bourne's sincere and forcible protest against the present wave of unreason should be taken seriously: D. H. Lawrence's "dark gods," Gertrude Stein's baby chatter, much modern poetry, and surrealist painting all proclaim the triumph of feeling over reason. The disastrous consequences of this widespread attitude of mind are plain to see. If we give way to this emotional crusade the future is dark indeed. Still, it is to be feared that one is left with the trite and discouraging reflection that if men were better than they are, the world would be a better place than it is. The book is published by Hutchinson and Co. at 2s. 6d.

Gas Warfare, by Mr. W. K. FITCH, editor of the *Pharmaceutical Journal,* is offered as a monograph for instructors. It describes the characteristics of all the known war gases, their physiological effects, the necessary precautions, and the curative treatment. This little book is remarkable for the breadth and extent of the information given, covering as it does a great variety of contingencies. It is presented in a well-arranged form and is written in a commendably lucid style. The publishers are the Pharmaceutical Press, and the price is 2s. 6d.

WILLIAM CLAYTON'S *Theory of Emulsions and Their Technical Treatment* (J. and A. Churchill; 42s.) deals comprehensively with all theoretical aspects of the subject. It describes the researches of many investigations and discusses the properties of many kinds of emulsions. The new (fourth) edition incorporates important recent work, notably that of Schulman and of King. Technical emulsions are treated in considerable detail, and the context is supplemented by copious references, nearly 2,000 being included in the index of authors. An interesting chapter deals with the biological aspect of the subject and describes the results of parenteral administration of fat in emulsified form. Among other observations it has been found that bacterial toxins such as those of diphtheria and tetanus lose their toxicity when adsorbed by oil globules. The book is of great practical value for the information it gives on the quality and behaviour of emulsions as well as for its excellent theoretical treatment.

War Gases: Their Identification and Decontamination, by MORRIS B. JACOBS, is a well-prepared handbook on gas warfare in its incidence on a civilian population. Its descriptions of war gases are especially useful to the personnel who may have to identify the gases and to estimate the extent of danger. It gives adequate data of the properties and behaviour of nearly forty gases, which include some that have not hitherto been used in warfare. Special attention is paid to the effects on food and to treatment for salving it. The book is of practical value to those whose approach to the subject is from a chemical standpoint, but it is so well written as to prove educational to others than chemists. It has been produced in New York by the Interscience Publishers, Inc., and is published in London at 18s. by the Imperia Book Company.

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PERNICIOUS ANAEMIA OF PREGNANCY

It has been appreciated for nearly 30 years that a severe macrocytic type of anaemia occurs rather frequently in pregnant women in India. A recent article by Mudaliar and Menon[1] gives a good account of the disease. Anaemia of all forms is unduly common in pregnant women in Madras; over 70% of them are anaemic by Western European standards. Macrocytic anaemia of pregnancy is actually more frequent there than pre-eclamptic toxaemia, and 103 cases were found in 1,200 admissions to the ante-natal wards. It manifests itself in the second or third trimester, and the presenting symptoms are oedema, dyspnoea, diarrhoea, heartburn, nausea, and vomiting. Labour is often premature and precipitate, and the gross maternal mortality is approximately 25%. The anaemia may be profound, and haemoglobin values ranged from 50% to less than 10%. By definition the anaemia in Mudaliar and Menon's cases was *macrocytic*—i.e., the mean volume of the red cells in all the women was above 85 cu. microns. Nevertheless, in nearly one-third the colour index was below unity, even as low as 0.5, which means that, though the red cells were always larger than normal, they were often incompletely filled with haemoglobin. In the shorthand of haematology the anaemia in this subgroup was *macrocytic hypochromic*, and by inference due to shortage of both P.A. factor and iron. Megaloblasts were always present in plenty in the blood films. Complete achlorhydria was unusual, and the diet differed in no way from that of the normal Madras woman admitted for confinement. Malaria and kala-azar were not aetiological factors, but hookworm infestation was a dangerous and not uncommon complication. Recovery is complete, but relapse may occur in subsequent confinements. The risk is not great, and is an admonition to supervision and not suspension of further pregnancies. In treatment marmite was disappointing, but good results were obtained with liver given parenterally. In exceptional cases the anaemia may not respond to liver therapy before delivery, and transfusion should then be employed in addition.

So long as search was confined to cases with a peripheral blood picture identical with that of Addison's anaemia, pernicious anaemia of pregnancy remained a haematological curiosity in Western Europe and the U.S.A. But macrocytosis is only one feature of the haematology of the anaemias due to deficiency of the P.A. factor. More pathognomonic characters are the presence of megaloblasts in the peripheral blood smear along with megaloblastic degeneration of the bone marrow, and the therapeutic response to treatment by liver. The rather sharp controversy in our correspondence columns[2] over the definition of the megaloblast may have shaken the faith of our readers in the second of these criteria, but this would be to misunderstand the point at issue. Classical teaching is that the megaloblast is a cell which is found only in foetal life and in anaemias due to lack of P.A. factor, and which is incapable of developing into a normoblast and normal red cell. An American view, which was popularized in this country by Witts in his Goulstonian lectures,[3] is that the megaloblast is a normal phase of erythropoiesis, of which fleeting glimpses may be seen in health and more concrete evidence whenever blood formation is much accelerated. For a time the tide of opinion turned back to the classical view, but it has been reversed again as a result of a study by Davidson, Davis, and Innes[4] of the changes produced in the bone marrow by liver treatment. All this, though of much theoretical interest, is of little importance in clinical work. Every haematologist agrees that the bone marrow in severe anaemias due to lack of P.A. factor shows an unmistakable picture, and a mere glance down the microscope is often enough to make the diagnosis.

Armed with their two powerful new weapons—the sternal puncture needle and the ampoule of liver extract—haematologists have infiltrated into the obstetric wards in the last few years and have shown that pernicious anaemia of pregnancy, though still very much less important than iron deficiency, is more prevalent in temperate climates than had been realized. At the meeting of the Association of Physicians this year[5] Fullerton reported 3 cases from Aberdeen and Sheila Callender 23 from Dundee. Subsequently Davidson's[6] group has reported 16 from Edinburgh, Lescher[7] 17 from Derby, and Miller and Studdert[8] 23 from Newcastle-upon-Tyne. Segerdahl[9] notes that 21 cases have been recorded in Sweden since 1938. It is probable that this sudden eruption of cases is due to improved diagnosis and not to increased incidence.

A few further details about the disease may be brought together from these papers. What was the diagnosis of these cases before we learnt to recognize them as pernicious anaemia?—sometimes toxaemia, but usually puerperal sepsis, on account of the high fever which may be present. Quite frequently symptoms do not draw attention to the illness until the puerperium. It is important that the pendulum should not swing to the other extreme, for pernicious anaemia of pregnancy still remains one of the least frequent causes of anaemia in pregnancy and the puerperium. Although the colour index may be low, the red cells are rarely of smaller size than normal. The haematocrit should therefore always be used to determine the cell volume. Sternal puncture is very desirable, but it demands the help of a skilled haematologist, for the marrow picture is more mature and the megaloblasts less numerous than in pernicious anaemia. The serum iron may also prove to be a diagnostic help, though there are not many centres in this country able to estimate it. It is important to remember that women with true Addison's anaemia may become pregnant, and that Addison's anaemia may begin during pregnancy. Patients must therefore be kept under supervision after confinement to exclude this possibility, though it can be more or less ruled out by a normal test meal. Subacute combined degeneration never occurs in pernicious anaemia of pregnancy, and the child is normal. Treatment must be far more intensive than in Addison's anaemia, particularly before the baby is born; iron is often needed as well as liver, and there should be no hesitation to transfuse blood. Crude intramuscular extracts of liver are said to be more effective than highly purified extracts, and whole liver by mouth is said sometimes to be more effective than parenteral treatment; but neither of these statements is supported by really convincing evidence. Lescher divided his cases into a pernicious type which responded to liver and a haemolytic type which responded to transfusion, but it is doubtful whether any such antithesis is at present justifiable, for anaemias due to lack of P.A. factor often show a strong haemolytic

[1] *J. Obstet. Gynaec. Brit. Emp.*, 1942, **49**, 284.
[2] *British Medical Journal*, 1942, **2**, 198, 256, 350.
[3] *Lancet*, 1932, **1**, 495.
[4] *Quart. J. Med.*, 1942, **11**, 19.
[5] Proc. Ass. Phys. Gt. Brit. Ireland, *Quart. J. Med.*, 1942, **11**.
[6] *British Medical Journal*, 1942, **2**, 31.
[7] *Lancet*, 1942, **2**, 148.
[8] Ibid., 1942, **2**, 332.
[9] *Acta med. scand.*, 1941, **108**, 483.

component. Aetiological factors cannot be discussed now, except to hint that some authors seem to forget that the one constant element in the disease is pregnancy. Pregnancy is a time of considerable endocrine disturbance, and it is known that pernicious anaemia is unduly frequent in thyroid and pituitary disorders.[10] Diet is undoubtedly important, but in pernicious anaemia of pregnancy, as in hookworm disease and idiopathic hypochromic anaemia, diet sets the scale of frequency of the anaemia in the community rather than determines its incidence in a particular individual.

CONTROL OF BACILLARY DYSENTERY

Two recent procedures in the isolation of dysentery bacilli have enabled Hardy, Watt, and de Capito[11] to make surveys of their incidence and persistence in individuals and in communities. The first is the introduction of improved selective media : desoxycholate citrate and Shigella–Salmonella agar. The second is the use of the rectal swab, which permits fresh uncontaminated specimens to be obtained at determined intervals and to be inoculated on culture media without delay. While previously carriers of dysentery bacilli were detected rarely, they are now discovered frequently and with relative ease. Using these new methods, Hardy, Watt, and de Capito made surveys of great epidemiological interest among normal population groups, contacts of dysentery patients, and convalescent carriers. Among groups of persons without a history of diarrhoeal disorder in the past year the incidence of dysentery bacilli varied from 3.8% in New Mexico, Georgia, and Puerto Rico to 0.1% in New York City. The authors do not state, however, whether they surveyed comparable social groups. In institutions for the feeble-minded the incidence fluctuated periodically between 0 and 22%. Family contacts of recognized cases had particularly high carrier rates—e.g., 28% in New Mexico. In a military unit with endemic diarrhoeal disease 10% of the men " on duty and officially well " were found to be harbouring dysentery bacilli. The authors followed up 103 dysentery patients with routine weekly stools and found among them 80% convalescent carriers. The duration of the carrier state was on an average 34 days, and was thus six times that of the acute stage of the illness. In another infected group 10% of the patients remained carriers for more than 10 weeks.

Evidently the recent improvements in laboratory technique are revealing that convalescent dysentery carriers occur more frequently than was previously supposed, and that they may continue to disseminate infection for days, weeks, or even months after the acute illness. New, too, is the knowledge that symptomless carriers often greatly exceed in number the currently occurring cases. These facts probably explain to a large degree the prevalence of endemic dysentery in this country and necessitate a review of the epidemiology of this disease and of its control. By bacteriological investigation carriers may be sought for among cases and intimate contacts in home, institution, or military unit. But hospital isolation until bacteriological recovery occurs spontaneously is difficult owing to the numbers involved, though it is essential for special groups —e.g., Sonne dysentery cases and carriers from nursery schools or infant homes. Hardy, Watt, and de Capito have shown that treatment with sulphaguanidine simplifies the control of Flexner and Newcastle infections, which in carriers as well as cases can be terminated promptly by its use. Among two groups of untreated controls and treated alternates, all were carriers of these organisms at the outset of their experiment. At the end of ten days 76% of the untreated and only 4% of the treated were positive, and on the following day all of the treated were negative. In addition there was a striking and rapid reduction in the number of colonies even before the individual became negative. Mass chemotherapy gives, therefore, promising results for the eradication of Flexner and Newcastle dysentery in heavily infected institutions, military units, and households. The position with regard to Sonne dysentery is not so clear-cut and the authors prefer to draw no definite conclusions from their small series.

The Emergency Public Health Laboratory at Oxford[12] reports that of 11 cases of Sonne dysentery from an outbreak among young children, all of whom were treated with sulphaguanidine, 9 became negative in 0 to 9 days, and 2 in 10 to 19 days. Of 10 symptomless excreters, also treated, 9 became negative in 0 to 9 days, and 1 in 36 days. The duration of excretion was less than that found by Hobbs and Allison[13] of the Cardiff Emergency Public Health Laboratory in cases that received no treatment with sulphaguanidine. The remaining two of the Oxford patients continued to excrete *Bact. sonnei* intermittently for two months and for more than three months respectively, though the latter patient had, in all, three courses of sulphaguanidine. There was no apparent source of reinfection. The work at Oxford raises the important question of the duration of isolation required before the safe release of a Sonne dysentery patient. Since the patients in this outbreak came from a residential nursery for young children and infants, it was essential to take no risks and to have a high standard of bacteriological recovery. At first children were returned from the isolation hospital to the nursery after three consecutive negative stools and were there quarantined for a further period of three weeks. On subsequent examinations after return it was discovered that 1 of the 10 children had a positive stool. The criterion of discharge from the isolation hospital had therefore to be altered, and thereafter 8 consecutive negative stools in 4 weeks, or at least 6 negatives in 6 weeks, were required. This 4- to 6-week period of hospitalization for both cases and symptomless excreters was felt to be necessary for the exclusion of further infection from the nursery. Indeed this view was justified by the finding on 5 occasions of a positive result after 3 or more negative stools. The investigators consider that further work is necessary on the intervals and number of negative results required before terminating isolation. For the elimination of Sonne dysentery in institutions it seems that a standard of negativity more stringent than prevails at present must be adopted before the return of convalescent patients and of symptomless excreters to the community.

ANTISEPTIC TREATMENT OF WOUNDS

The revival of belief in antiseptics, given its first impetus by the success of local sulphonamide treatment and accelerated by the discovery of gramicidin and the rediscovery of penicillin, has now passed a further stage. This is a rediscovery of the possibilities of an antiseptic which has been available for a quarter of a century. According to G. A. G. Mitchell and G. A. H. Buttle,[14] whose patients were casualties from Libya, proflavine powder introduced into intractably suppurating wounds often has a dramatic effect in drying them up and promoting rapid healing, with a marked improvement in the general condition. They treated 80 cases in this way, using from 0.5 to 2 g. of the powder according to the size of the wound, and in only 6 was it apparently quite ineffective. In only one

[10] *Lancet*, 1942, **2**, 307
[11] *Publ. Hlth. Rep.* Wash., 1942, **57**, 521.
[12] *Mthly. Bull. Emer. publ. Hlth. Lab. Serv.*, November, 1942, p. 2.
[13] Ibid., July, 1942, p. 1.
[14] *Lancet*, 1942, **2**, 416.

was there any suggestion that healing had been delayed by the treatment. Proflavine acts on all bacteria found in suppurating wounds, although *Proteus* is the most resistant to it; it is particularly valuable in dealing with staphylococcal infections, because these resist other treatment. Many of these cases had had full courses of systemic as well as local chemotherapy, sulphathiazole and sulphanilamide being used, with no benefit, before proflavine treatment was begun. A small amount of proflavine (0.25 g.) has also been used as a mixture with sulphanilamide (2 to 5 g.) for prophylaxis, but no actual evidence for the efficacy of this proceeding is offered. The authors appear to consider that sulphanilamide, on account of its known harmlessness to tissues, should be the mainstay for prophylactic use.

Antiseptics have been used as a matter of course for the treatment of infected wounds ever since the time of Lister, but rarely with any striking effect and usually with little expectation of it. To suggest that any recognized antiseptic of some standing can actually terminate infection in a wound within a few days is almost revolutionary. This is in fact a much more striking achievement than the mere prevention of infection in a wound where tissue invasion has yet to begin. It is worth while to examine the causes of this success. The flavines and related compounds stand alone in having been shown experimentally to be capable of preventing wound infections. They are highly, although slowly, bactericidal, and comparatively innocuous to tissues; the degree of their toxicity for leucocytes was the subject of what is now a historic controversy, but, whatever the truth on this specific point, it is at least undeniable that they can be applied to a surface or even injected interstitially without causing evident damage. Reconsideration of their properties in recent years has pointed to proflavine as preferable to acriflavine, and the studies of Russell and Falconer,[15] who showed that an isotonic solution of proflavine buffered to a reaction near neutrality could be applied even to the brain without causing more damage than that inflicted by normal saline, did much to rehabilitate this antiseptic in general estimation. Hawking[16] found experimentally that it prevented anaerobic wound infection with at least as much certainty as the sulphonamides, but discounted these effects in view of the mediocre results obtained with acridine compounds in the last war. As was pointed out in this *Journal*, to deny the significance of controlled experiment by adducing uncontrolled clinical evidence obtained under bad conditions many years earlier is questionable logic: Hawking's findings were rather an indication that proflavine should be given a further and better-conducted clinical trial. Granted that proflavine is, among the older antiseptics, possibly the best of its kind, and theoretically capable at least of preventing wound infection without doing undue tissue damage, it remains to be explained why it now appears to have achieved a success such as has never been claimed for it before. The probable explanation of this is the simple fact that for the first time it has been applied, as sulphonamides have always been applied, in solid form. Its solubility is about 1 in 300—almost ideal for persistence of effect combined with adequate concentration. Much antiseptic treatment in the past has probably been ineffective owing to misapplication; neither irrigation with a solution nor the application of a dressing soaked in it can secure the penetration and persistence afforded by a slowly dissolving solid. Treatment with proflavine powder will doubtless be extensively tried, and final judgment on its merits for various purposes will be awaited with interest. Proflavine also performed well in a study now reported by J. McIntosh and F. R. Selbie[17] of the capacity of several antiseptics for inhibiting the development of *Cl. welchii* infection in mice. It was decidedly more effective than sulphanilamide, and inferior only to penicillin. Zinc peroxide was moderately effective if applied at once, and comparison with zinc oxide and with a preparation yielding hydrogen peroxide indicated that zinc itself rather than oxygen is responsible for its effect. Gramicidin had little if any influence on the infection, in spite of its enormous capacity for preventing the growth of *Cl. welchii in vitro*. These facts will be a valuable guide in framing any new policy for preventive application to wounds. On present information there seems to be a strong case for the trial of proflavine powder for this purpose.

[15] *Brit. J. Surg.*, 1940–1, **28**, 472.
[16] *British Medical Journal*, 1941, **1**, 263.

OESTROGEN TREATMENT OF DIABETES

The relatively high incidence of diabetes mellitus in women at the menopause is quite possibly connected with a hyperactivity of the pituitary gland, which is then no longer inhibited by gonadal secretions. This view is logical enough to suggest that treatment with oestrogens or androgens in doses adequate to depress pituitary function might do good. A further reason for the use of oestrogens lies in their capacity to increase the insulin content of the pancreas,[18] lead to hypertrophy[19] of the pancreatic islets, and stimulate their secretory activity.[20] In theory, therefore, such treatment has much to recommend it; in practice the results have been conflicting. Animal experiments at first suggested that oestrogen injections diminished the intensity of the diabetic state in depancreatized dogs[21] and monkeys.[22] These results led to clinical trials, and alleviation of diabetes in menopausal women injected with oestrogen was claimed by Gessler and his colleagues,[23] by Spiegelman,[24] and by Cantilo.[25] Saurer[26] also reports a fall in the fasting blood-sugar level and a depression of the glucose-tolerance curve (whether the glucose was given orally or intravenously) in menopausal diabetic patients given large doses of oestrone or testosterone. All these clinicians have, however, used natural oestrogens or androgens; they find that big doses are necessary, and attribute any success to a depression of hypophyseal function. The substances were injected, and there was in general a recurrence of the full pre-treatment symptoms when the injections were stopped. The treatment therefore has no advantage in comfort over insulin treatment, and it is presumably better to inject insulin, which has a specific action, than to inject unphysiological amounts of the sex hormones, which depress other hypophyseal secretions besides the diabetogenic one. However, there appeared to be little doubt that the theory behind the use of oestrogen had received practical confirmation.

With the discovery of the orally active synthetic oestrogens the subject was reopened. If orally administered stilboestrol could replace insulin injections it would be a great advantage to the patient's comfort and pocket. The first report on the use of stilboestrol[27] dealt with 4 cases, of which only 2 were treated orally. One of these was given 5 mg. daily for 6 weeks, which eliminated the need for insulin and reduced the blood sugar from 180 mg. to 123 mg. per 100 c.cm., but glycosuria persisted; the other patient was kept symptom-free by daily doses of 3 to 15 mg. for 3 months. Unfortunately later results

[17] *Lancet*, 1942, **2**, 750.
[18] *Nature*, 1940, **146**, 266.
[19] *Lancet*, 1936, **1**, 247.
[20] *Nature*, 1940, **146**, 589.
[21] *J. Amer. med. Ass.*, 1933, **101**, 926.
[22] *Endocrinology*, 1936, **20**, 473.
[23] *J. clin. Invest.*, 1939, **18**, 715.
[24] *Amer. J. med. Sci.*, 1940, **200**, 228.
[25] *Endocrinology*, 1941, **28**, 20.
[26] *Schweiz. med. Wschr.*, 1941, **71**, 1577.
[27] *J. Amer. med. Ass.*, 1941, **116**, 675.

have not been encouraging and have cast some doubt on the whole question of the value of oestrogens in post-menopausal diabetes. First, Young[28] tried the effect of stilboestrol and oestrone on pituitary-diabetic and depancreatized dogs. Both substances were given by subcutaneous injection and by subcutaneous implantation of tablets, but in neither case did Young find evidence of any benefit, in spite of the fact that he was using doses very much greater than those used by the American workers.[21 22] Lawrence and Madder[29] at the same time failed to demonstrate any effects of doses of 1 mg. of stilboestrol given 4 times daily for a period of 8 weeks to 5 diabetic women aged 42 to 52. Again, Salmon and his colleagues[30] implanted stilboestrol tablets into 18 menopausal diabetic women and found an improvement in insulin requirement and glucose tolerance in only one. Thus the value of oestrogens in the treatment of post-menopausal diabetes is by no means so clear-cut in practice as it is in theory.

TREATMENT OF ISCHAEMIC CONTRACTURE

Volkmann's ischaemic contracture was originally thought to be due to circulatory obstruction resulting from the over-tight splinting or bandaging of fractures in the region of the elbow-joint. This theory was upset by the clinical evidence, however, because many cases were reported in which neither splints nor bandages had been applied. So the more modern version of the mechanical obstruction theory was propounded. This supposed the obstruction to be due to internal pressure from a subfascial effusion or haematoma in the antecubital fossa, and to be venous rather than arterial. Brooks[31] showed experimentally, as later did Middleton,[32] that if the entire venous drainage from a muscle were ligated the muscle developed a contracture. This they regarded as being identical with Volkmann's, but Griffiths[33] demonstrated conclusively that the histology of the two conditions was entirely different, and in the same paper produced further evidence against the venous occlusion theory by recording three cases which followed arterial embolism—in other words, cases in which the venous system was completely unaffected.

What, then, is the essential pathology of Volkmann's contracture? According to Griffiths—and his clinical and experimental evidence is most convincing—it is due to segmental spasm of the main artery to a limb, accompanied by reflex spasm of the collateral circulation. If the main artery alone is occluded and the collateral circulation functions, then no ill effects are observed. If the collaterals go into reflex spasm, however, the result is either gangrene or Volkmann's contracture according to whether the spasm is complete or incomplete. Foisie,[34] reviewing the early operative findings in 30 cases reported from many sources during the last two years, points to their striking similarity. In all, the lower end of the brachial artery was reduced by spasm to a string-like structure in which pulsation had ceased. Barnes and Trueta[35] have now brought forward additional experimental evidence in support of the earlier work of Griffiths. By applying a wire tourniquet for four hours they were able to produce a persisting spasm of the femoral artery in rabbits, and showed by arteriographic studies that the collateral circulation was also in spasm. They further found that the spasm of the collaterals could be abolished by lumbar sympathectomy, though the main vessel remained in spasm, and that in the rabbits in which the collateral circulation was not released in this way changes occurred in the muscles identical with those seen in Volkmann's contracture.

It is obvious, therefore, that the crucial factor is the reflex spasm of the collateral circulation. It seems established that the impulses causing this spasm originate in the walls of the occluded main vessel, but their subsequent path has not been precisely determined. They travel by way of the sympathetic system, but in human beings, at all events, they do not seem always to be relayed through the paravertebral ganglia. Successful blocking of the stellate ganglion, as evidenced by the development of a typical Horner syndrome, has failed to release the collateral circulation,[36] so there must be a more peripheral reflex path. The most certain method yet known of abolishing the reflex is to interrupt it at the source by resecting the segment of main artery in spasm, a procedure originally proposed by Leriche. This operation (arteriectomy) has proved reliable in all the published cases and is the one of choice, but it must not be delayed too long. Tight plasters or bandages, or overflexion of the elbow-joint, are factors that cause additional circulatory embarrassment and should be removed. Moreover in some cases, notably in gunshot wounds in which the damage is confined to the soft tissues, the reflex spasm of the collaterals may pass off spontaneously. But faced with the possibility of such a severely crippling condition as Volkmann's contracture the surgeon should not wait long now that he has this valuable weapon to hand.

THE HEAVIEST WOMAN

If the late Mrs. Ruth G. Pontico, of Tampa, Florida, was not the heaviest woman in proportion to her height that the world has yet seen, her record can seldom have been exceeded. Willoughby,[37] who has described the case in detail, states that fewer than twenty instances of weight exceeding 700 lb. are to be discovered in the literature, even if those of questionable authenticity are included. But, whereas most of these people were tall, Mrs. Pontico was only 5 ft. 5½ in. in height; yet in 1939, at the age of 35, she weighed 772½ lb., or more than 55 stone, and may well have exceeded 800 lb. before her death two and a half years later. Her chest measurement was 81½ in., her waist 76½, and her hips 91. Incidentally Willoughby discloses a curious source of error which has sometimes given these giants of girth an extra 100 lb. or so to which they were not entitled, for the weights taken after death occasionally included the coffin, a fact explained in the original record but carelessly omitted by later historians. Mrs. Pontico owed much of her professional success—for naturally she was a "fat lady"—to the fact that she had parents of the right sort. Her mother, a member of the same profession, tipped the scale at 720 lb. and was 6 ft. high. Her father was also 6 ft. high and weighed a mere 250 lb. Their daughter is said to have begun her gargantuan career by weighing 16 lb. at birth; at 1 year she weighed 50 lb.; at 10 years she touched the 300 mark. It might be thought that to manœuvre such mass freely would be difficult. But she climbed to the second floor of her home once or twice a day, and every few days was able, with rests, to walk round her extensive grounds. She took about half as much food again as a normal person. When 29 she survived an attack of pneumonia, though it took her a year to regain her health and the 200 lb. which she lost. Death followed an operation for the removal of a fatty tumour.

[28] *Lancet*, 1941, **1**, 600.
[29] Ibid., 601.
[30] *J. Amer. med. Ass.*, 1941, **117**, 1843.
[31] *Arch. Surg.*, Chicago, 1922, **5**, 188.
[32] *Brit. J. Surg.*, 1930 **18**, 188.
[33] Ibid., 1940, **28**, 239.
[34] *New Engl. J. Med.*, 1942, **226**, 671.
[35] *Brit. J. Surg.*, 1942, **30**, 74.
[36] Seddon, H. J. (quoted by Barnes and Trueta, above).
[37] *Human Biol.*, 1942, **14**, 166.

Nova et Vetera

FOLK-LORE OF THE ACUTE EXANTHEMATA

In a paper read before the Section of the History of Medicine of the Royal Society of Medicine, Dr. J. D. Rolleston said that in contrast with some diseases, particularly whooping-cough, pulmonary tuberculosis, skin diseases, warts, and eye diseases, the folk-lore of the eruptive fevers was somewhat scanty, though rich enough to justify a special communication. The amount of folk-lore connected with each exanthem was in direct relation, he said, to the antiquity and importance of the disease, so that in this respect small-pox, measles, scarlet fever, and chicken-pox were represented in the order named. There did not seem to be any folk-lore connected with German measles, which did not receive general recognition as an independent disease until after the International Congress of Medicine held in London in 1881. Dr. Rolleston made the following remarks on the folk-lore of the acute exanthemata as a group before dealing with the individual diseases separately.

With regard to causation, there did not appear to be any popular causes suggested for their occurrence, such as catching cold, sexual excess, or punishment for an evil life, as in the case of pulmonary tuberculosis, skin diseases, and venereal diseases. With the exception of small-pox, none of them had been assigned a Divine origin. In accordance with medical folk-lore generally, prophylaxis was rarely employed in the acute exanthemata except small-pox. There were many examples of the same treatment being applied to the acute exanthemata in general, such as overheating the patient or flagellation with nettles with the object of bringing out the rash, the use of red blankets and bed-hangings, and coprotherapy.

With regard to the causation of small-pox, Sir James Frazer and others gave numerous examples of outbreaks of small-pox in different parts of the world being attributed to a goddess or, much more rarely, to a god, and of the various means employed to win their favour or prevent their visitation. Examples were given, too, of the avoidance of calling the deity and the disease by their proper name, and of using instead some more or less euphemistic words or phrases. The supposed transfer of small-pox to animals, plants, and inanimate objects in accordance with folk-lore practice in other diseases was also described. Prophylaxis of small-pox by inoculation was a folk-lore method carried out by old women in Turkey long before it was adopted by the medical profession in England and France. Besides overheating the patient, the folk-lore treatment of small-pox consisted mainly of animal and plant remedies and the invocation of patron saints.

A greater number of popular errors were connected with measles than with any of the other acute exanthemata, such as the belief that it was a trivial disease, that it cleaned out the system and made the child less liable to contract other diseases, and that patients should not be washed owing to the delusion that such an act tended to drive the rash inwards. In none of the acute exanthemata was coprotherapy more often employed than in measles, especially in the early stage of the disease. There were several examples of the belief that measles could be best treated by transfer of the disease to animals and plants, and, apart from any idea of transfer, numerous folk-lore remedies were supplied by animals, plants, and minerals.

Doubtless because scarlet fever had been isolated as an independent disease much later than small-pox and measles, its folk-lore was much less than that of the other two diseases. Popular errors connected with it included the view that the term "scarlatina" meant a mild form of the disease, that second attacks did not occur, and that a mild attack could transmit only a mild attack to another person. Instances were occasionally met with in which scarlet fever was supposed to be transferred to animals, such as the dog, bear, or sheep. Amulets were sometimes worn for prevention of the disease. There did not appear to be any patron saints connected with scarlet fever as in small-pox and measles.

Although chicken-pox was probably as old as small-pox, owing to its usually mild character and uncomplicated recovery very little folk-lore had gathered round this exanthem, but it had had a large number of popular synonyms which were out of proportion to its real significance. The term "chicken-pox" was first used in medical literature in 1694 by Richard Morton, who spoke of a form of small-pox "called in the vernacular the Chicken-pox." Fuller also, in 1730 in a paragraph in his *Exanthematologia*, wrote: "I have adventur'd to think that this is that which among our women goeth by the name of Chickenpox."

Another example of folk-lore anticipating scientific medicine is furnished by the fact, recently mentioned by W. N. Pickles, that the connexion between herpes zoster and chicken-pox had been known at Aysgarth, in Yorkshire, long before this was demonstrated by Bokay in 1892.

GUESTS OF ST. DUNSTAN'S

Before the war arrangements were made for members of the Canadian Forces suffering serious eye injury in any European theatre of war to receive treatment at St. Dunstan's and at its training centre; this arrangement has now been extended to the U.S. Army. At a luncheon recently given by St. Dunstan's to senior officers of the American and Canadian Army Medical Services, Mr. Ernest Brown, Minister of Health, recalled that in the early days of the war a number of American doctors came to this country at their own expense and without remuneration to help at our general and special hospitals. When the U.S. Forces began to arrive it was arranged that any members of the American Services needing treatment should be accommodated in E.M.S. hospitals. In addition the Ministry of Health had handed over 5 new hospitals, fully equipped, to them, while the Canadian Forces had the use of 8 hospitals. Sir Ian Fraser, who presided at the luncheon, said that in this war, owing, presumably, to the increased use of armour in tanks and planes, fewer men were blinded by metal fragments than in the last war. A larger proportion, however, were blinded by concussion changes in the eye, causing collapse or irreparable damage through haemorrhage. Approximately two hundred and eighty-eight cases had come under the care of St. Dunstan's in this war ; 88 of the patients had recovered some useful eyesight, but 200 would not recover their sight at all. Of these 200, half were in training or had been trained at St. Dunstan's in England and 30 were prisoners of war. He estimated that there would be 40 cases out of the recent fighting in Africa. It had been arranged that all American soldiers who might be temporarily or permanently blinded should be sent to St. Dunstan's for 3 to 6 weeks while waiting to return home; the first American guest was due to be admitted the following day. Brig.-Gen. Paul Hawley, chief surgeon of the U.S. Army in the European theatre of operations, said that the great shock to the blinded American soldier would come when he returned home handicapped and helpless to his family. Now he would be able to return after his St. Dunstan's training walking with confidence and facing the world with courage.

HEALTH ON THE HOARDINGS

Dr. Johnson declared that the full tide of human existence is at Charing Cross, and here there has lately been arranged, in the entrance hall of the underground station, a health exhibition under the patronage of the Ministry of Health. It is announced as an exhibition of photographs, but it is even more an exhibition of placards and posters, and some of the cartoons and slogans are not only pointed but amusing, which is a very good propagandist approach. Simple rules for fitness, condensed advice on maternity and child welfare, instruction on the dangers of contaminated food and of droplet infection are conveyed in such a way as to catch the eye of the most hurried traveller. The only disadvantage is the restricted space. Mr. Ernest Brown, at the opening ceremony, remarked on the steadily growing co-operation of the public with the health authorities, a co-operation which has been accelerated during the war. One of the results of the awakened health conscience in Great Britain, he said, was that the nation went into this war fitter than into the war of 1914, and now in the fourth year of hostilities the value of the careful work of the last quarter of a century was becoming fully revealed. Sir William Beveridge, said Mr. Brown, made three assumptions as the basis of a satisfactory system of social security, and one of them was a comprehensive service not only for the cure but for the prevention of disease, the others being family allowances and avoidance of mass unemployment. But the awakening is still far from complete, as is shown by the number of parents who neglect the facilities for immunizing their children against diphtheria, and also the facts revealed by an investigation of a cross-section of the public in which the investigators have reported to the Ministry that large numbers of people are "stumped" by the question as to where they should go for advice on the prevention of illness. Incidentally, the Minister gave a word of hearty praise to the work of the Central Council for Health Education and its chairman, Dr. Charles Hill.

IMPROVED ARRANGEMENTS FOR THE TREATMENT OF TUBERCULOSIS

Speaking in the House of Commons on October 8 the Minister of Health, Mr. Ernest Brown, stated that he had already acted on a number of the recommendations of the M.R.C. Committee on Tuberculosis in Wartime (*Journal*, Oct. 10, p. 436), and a circular (No. 2741) now issued to local authorities provides some further information. First, a limited number of portable sets for mass miniature radiography (in the House of Commons the number 30 was mentioned) are to be allocated to certain named county and county borough councils, delivery to begin early in 1943 and to be completed during the year. Secondly, arrangements are being made by the Ministry for training the necessary technical staff to operate this equipment, and this will be the subject of a later communication to local authorities. Thirdly, additional hospital beds are to be freed for the treatment of tuberculous patients, and steps are being taken, in conjunction with the Ministry of Labour, to provide further domestic and nursing staff. On the important recommendation of the committee that there should be special financial provision for those undergoing treatment, the circular says that the Ministry and representatives of local authorities are already working out a scheme of uniform assistance for all those who suffer loss or reduction of income while undergoing treatment and who have one or more persons dependent on them. The assistance will normally take the form of maintenance allowances for the patient and his dependants, and should also be available towards meeting reasonable obligations, in excess of a prescribed figure, incurred for rent and rates, building society contribution, insurance policies, and the education of children. The tuberculosis authority will usually administer these allowances. No charge should be made for the cost of institutional treatment, and, finally, local authorities will be reimbursed for expenditure incurred in the payment of these allowances. Particulars of the scheme will be circulated later.

Correspondence

Byssinosis

SIR,—May I call attention to the statement, which may give rise to some misunderstanding, in your leading article on byssinosis and bagassosis (Jan. 9, p. 46), that byssinosis is scheduled under the Workmen's Compensation Act? Owing to the special features of the disease it was not considered appropriate to schedule it in the ordinary way, but it was dealt with by a special scheme made under the powers obtained in the Workmen's Compensation and Benefit (Byssinosis) Act, 1940.—I am, etc.,

S. A. HENRY,
H.M. Medical Inspector of Factories.

London, S.W.1.

Sick Absence among Munition Workers

SIR,—While agreeing with the opening paragraph of the article by Drs. A. Massey and R. C. M. Pearson on sick absence among munition workers (Dec. 12, p. 694), in which the authors state the value of industrial medicine, I am at a loss to understand certain aspects of both the figures given and the mode of their presentation.

First, although they state in their conclusion that "consideration of factory working hours is inseparable from the problem of sick absence," no indication is given of the hours worked by the seven firms described nor even of whether these are comparable or widely different for males and females. Again, although it is stated that "in explaining the higher absentee figure for males . . . the greater physical demands made of males by the nature of their work is also a relevant factor," very little indication is given as to the nature of the work performed, beyond saying that it is engineering, which, to say the least, is divided into "light" and "heavy" engineering. I appreciate that security considerations demand the withholding of many relevant particulars, but, even so, a division into the above category would have been very helpful and would not have imparted confidential information.

Secondly, although the authors state that their figures show a higher sick absence rate for males, it will be seen that this condition in fact prevails in only two of the seven firms they have examined—namely, Firms 3 and 7, both of which, in my opinion, should not have been included, because the former had an insufficient number of females to afford a basis of comparison, and the latter shows figures so different from the other five firms as to indicate special circumstances demanding further investigation.

In the remaining five firms the rates for males and females are to all intents and purposes approximately equal. In comparing this with my own figures for the same period relating to a number of females somewhat in excess of the total of the seven firms examined by Drs. Massey and Pearson and to a somewhat smaller number of males, all engaged on light engineering and working regular overtime, I find an entirely different state of affairs, as shown by the table below:

Percentage of Workers Absent, Sick, etc. (All Causes), Month by Month

Source	Sex	Nov.	Dec.	Jan.	Feb.	Mar.	April
Drs. Massey and Pearson (Table III)	Males	8·2	7·1	9·1	8·5	8·5	8·7
	Females	7·5	6·4	8·0	6·8	7·5	8·6
Figures obtained by myself	Males	1·95	1·8	1·7	3·0	2·2	3·2
	Females	3·8	3·8	4·2	4·6	3·9	2·6

In my case the over-all rate of sickness absence is only about half of that shown by Drs. Massey and Pearson, with the rate for females almost twice that of the males. It is difficult to understand this disparity, particularly in view of the authors' statement that the equivalent of only 50% of males and 45% of females lost time from sickness in the six months under review. My records show that at least 33% of all operators lost half a day or more by absence from all causes in a review of one month, and that 45% of all absence was caused by medically certified sickness of more than three days' duration. On this comparison the sickness rate should be less than my own, instead of being twice as great.

The authors do not, however, state explicitly whether their figures relate to medically certified sickness of three days' duration or over, or whether absences of half a day to three days are wholly or partially included. Their Table IV, however, implies that short terms of absence are excluded from all categories other than "other occupational diseases," which have an average duration of absence of, say, 10 hours as opposed to 65.8 hours for colds. I most heartily endorse the authors' recognition of the need for "improved and standardized sickness records relating to factories," and, failing this, suggest that, for figures to be valuable, information as to exactly what they cover must be most precise and explicit.

Lastly, I do not agree with the authors' conclusion that "the health of the munition workers . . . is on the whole maintained." Apart from the fact that their figures in Table III show one in every twelve workers incapacitated by sickness at any given time, those same figures show, if not a persistent tendency to rise from November to April, at least an absence of the seasonable drop which one would have expected by April. I have sickness records dating back to January, 1939, and in that and every succeeding year until 1942 the sickness rate has almost doubled in January and February and returned to normal by April. In 1942, however, no return to normal has occurred: the figures, having fallen only slightly in April and having exceeded the January value for most of the year, are still steadily climbing. The absence of influenza epidemics in 1941 and 1942 should increase the probabilities in 1943, and with a resultant potentially increased sickness rate. It therefore appears that every possible measure in preventive medicine should be taken against the winter incidence of colds and influenza in the factories, and that serious consideration must be given now to the problem of working hours. While for a short spurt the health of the workers can stand up to long hours, for a sustained effort long hours can only be done at the expense of health.

The medical profession must play its part in advising industrial managements of the long-term factors of their policy on the health of the employees, and in particular it must assist in adjusting working hours in relation to the work done and the conditions prevailing. These conditions include the demands made of workers by Civil Defence duties, the domestic situation in homes where both the man and wife are working, the decreased supplies of food available and the increased shopping difficulties in obtaining them, the increased difficulty in obtaining domestic help, laundry, labour-saving appliances, and even suitable housing accommodation itself, together with travelling and transport difficulties. Working

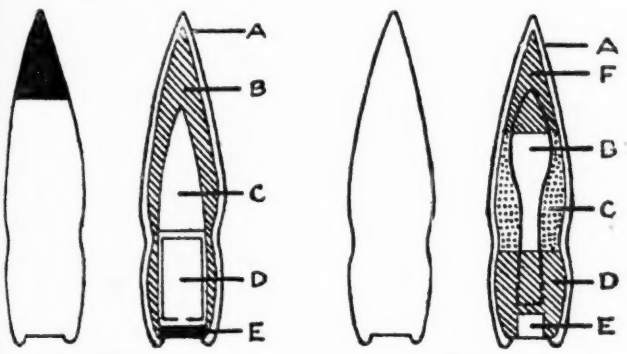
hours should be so related to all of these factors that demands to increase output by working long hours do not defeat their own ends by causing excessive sickness absence.—I am, etc.,

JACK TARSH.

German Explosive Bullets

SIR,—In July, 1942, an enemy aircraft crashed and in doing so thousands of rounds of ammunition were scattered about. These were seized by sightseers, and no doubt many a mantelpiece is now decorated with them. As the result of a remark passed by a member of the public that this ammunition was explosive I investigated it, and found that some of these bullets contained an explosive charge and phosphorus. This information was passed on to the correct quarter.

Mr. A. J. Blaxland (Dec. 5, p. 664) described a case of phosphorus poisoning. I have since been in communication with him and mentioned the affair of July, and the results I found were the same as those of Lieut. Wheeler. As Mr. Blaxland in his article had described only one type of phosphorus bullet, we wondered whether you thought it would be of interest or benefit to the medical profession if the three common types of German bullets were brought to their notice, subject to the permission of the censor. We both thought it surprising that if the experts were aware of the types and the dangers associated with them, the medical profession as a whole were kept in the dark, especially as now there seem to be more cases of injury as a result of haphazard machine-gun fire from the air. I have therefore, with Mr. Blaxland's consent, drawn diagrams of two further types and added a description of each.



TYPE 1 TYPE 2

There appear to be three types of German machine-gun bullets in use at the present time. All types are of the .312 Mauser pattern.

Type 1.—The outside of this bullet is copper in colour, and has its nose painted black for 1 cm. from the tip. The outer case is copper-plated steel (A in diagram) with an inner coating of lead (B) more solid in the nose. Inside the lead coating there is a hardened steel bullet (C) on the end of a detonator (?) (D), which is separated from the end of the bullet by a thin lead membrane (E). The ends of the casing are curled into the base, and the lead is visible from below. The detonator (?) is encased in a cylinder of copper-plated steel.

Type 2.—This is unpainted, being copper-coloured. The outer case is made of copper-plated steel (A). It has a lead nose (F) into which is set a hardened steel cone (B) which tapers as it leads towards the end of the bullet. The end is also set in a lead weight (D), which is bored out to fit the end of the cone. The hole is plugged with a lead plug (E). The intervening space (C) is filled with 10 gr. of phosphorus. It would appear that on impact the lead weight (D) slides up the cone (C) and splits the casing, and at the same time squeezes the phosphorus out.

Type 3 (the explosive phosphorus).—This type is described and illustrated by Mr. Blaxland and contains the detonator and pin. It can be recognized by the black band that is painted around the outside, leaving 1 cm. at the tip copper-coloured.

—I am, etc.,

J. R. F. POPPLEWELL.

Three Years of Military Psychiatry

SIR,—May I be permitted not only to congratulate Dr. J. R. Rees on his promotion to the rank of Brigadier but also on his most excellent article under the above heading (Jan. 2, p. 1). In this he states that it has been decided at a conference that pensions would not be given to cases presenting "neurotic" symptoms. This is to adopt the French system of the last war with this difference, that "exceptional cases" are to be recognized. I therefore wonder what will constitute an "exceptional case" and who will decide this.

I expect that others like myself have already seen quite a number of cases, including not only the "dull and backward" but also definitely mental defectives as well as "psychoneurotics," who have given endless trouble since enlistment, and been subject to repeated punishments before it has been realized that their "mental condition" was responsible for their inability to adapt themselves to Army conditions. Only a few days ago a lad of about 20 years of age, who had been enlisted last September, was referred to me on account of "nocturnal enuresis." He had passed the medical recruiting board as quite fit, but admitted to me frankly that he had suffered from this trouble all his life.

While the efforts being made by Brigadier Rees and his assistants to find suitable occupation for these "misfits" in the Army are beyond all praise, my contention is that if more serious attention were given to nervous and mental manifestations before enlistment and more cases presenting these symptoms were rejected instead of being suspected as being malingerers a great deal of time, trouble, and expense would be saved.—I am, etc.,

Exeter. RICHARD EAGER.

Joint Committee on Rheumatism and Orthopaedics

SIR.—Drs. Ray, Heald, and Nissé are not correct (*Journal*, Jan. 9, p. 54). There are twelve members only of this committee, of whom six represent the British Orthopaedic Association. I am one of these, and although my name is mentioned twice in the published details I am a singular fellow (R.C.S.)! Your correspondents mention two of the physicians as being concerned with the work of the British Red Cross Clinic for Rheumatism, but they omit to note that two of the orthopaedic representatives are also on the staff of that organization.

The fact remains that the formation of this Joint Standing Advisory Committee is an important step forward in the furtherance of plans for collaboration which both the Empire Rheumatism Council and the British Orthopaedic Association keenly desire. Both have very large contributions to make in a service of great national importance for the prevention and treatment of crippling disability. Obviously the committee will have to consult other groups and individuals, working for the same cause.—I am, etc.,

Exeter. NORMAN CAPENER.

Promanide in Local Treatment of Tuberculosis

SIR,—The importance of recent work in the U.S.A. and in this country on the effect of promanide (promin) on experimental tuberculosis in animals can hardly be exaggerated.

Efforts to apply, without too much delay, the results of this experimental chemotherapy to the treatment of the disease in man are to be welcomed. As one who has followed this work with the keenest interest since its inception in the laboratories of the Mayo Clinic, may I submit some observations prompted by the appearance in your *Journal* of the paper by Prof. W. H. Tytler and Dr. A. D. Lapp (Dec. 26, p. 748).

It is to be hoped that an adequate supply of promanide will be made available to those in a position to repeat and extend such tentative clinical trials as have already been made, though its use in an uncontrolled and unscientific manner is certainly to be deprecated. At present it is extremely difficult to get a supply of promanide.

The possible methods of application of the drug, as well as the types of lesion to be treated, deserve serious consideration. It would seem to me that cases in which it is proposed to make clinical trial by local application should be unconnected with a focus of deeper-lying disease, as such latter cases are unlikely to make a permanent response unless the underlying lesion (say, in bone, joint, or glands) is quiescent or can itself be directly attacked by the promanide. In Case 2 of Tytler and Lapp's series, in which the results are described as "spectacular," the two abscesses which healed with such extraordinary rapidity following the injection of promanide jelly appear to have been isolated metastatic soft-tissue lesions unconnected with a contiguous and deeper-lying focus of disease. If such selection is not observed the likelihood of failures is great, and may effect the premature disrepute of a possible new and highly important—even though extremely tentative—form of treatment.

It seems important, too, that cases treated with promanide should be controlled, so far as is possible, by very careful comparison with numbers of similar cases treated by accepted methods. I have two cases under my care comparable to Case 3 in Tytler and Lapp's series—one of tuberculosis of the dorsal spine, the other of tuberculosis of a hip-joint. Both had huge abscesses, one of which was about to point, despite repeated aspirations. Both of these abscesses absorbed in three months during a time when natural heliotherapy was possible, and neither shows any signs of recurring.

One mechanism of spread of the tuberculous process is through the lymphatic channels. Would it not, therefore, be worth while to attempt the introduction of promanide more directly into the lymph system? Dyes and Indian ink have been introduced, by way of the fauces, into the lymphatic channels and glands in the neck of rabbits and cats, the better to study the anatomy of those structures. Why not attempt a similar route for the introduction of promanide in cases of tuberculous cervical adenitis?

In connexion with some chemotherapeutic research in experimental tuberculosis to which I was witness in the Leningrad Institute of Tuberculosis, lesions were prevented from developing in the lungs of guinea-pigs and rabbits if, at the same time as the infective material was injected intravenously, cobalt oleate was injected intrapleurally. Presumably this was an effect obtained through lymphatic absorption of the cobalt oleate into the lymphatic channels of the lung. Would not a similar route be worth trying in the case of promanide, both in experimentally induced pulmonary tuberculosis in animals as well as in cases of the disease in man? M. R. Castex, E. L. Capdebourat, and E. A. Pedace (articles reviewed in the *Amer. Rev. Tuberc.*, March, 1942, p. 61) have shown that nebulized solutions of scarlet red and methylene blue when inhaled penetrate to the depths of the lung, provided the particles of the spray are small enough (not larger than 5 μ). They treated 100 cases of non-tuberculous pulmonary suppuration by inhalations of nebulized solutions of prontosil, and come to the rather sweeping conclusion that "surgery is no longer needed in pulmonary suppuration." Such treatment is rendered difficult by the rapid absorption of the inhaled solutions, and this would, no doubt, hold true for nebulized solutions of promanide. Why not, however, look for a different vehicle for promanide in this connexion? Would not a solution, a suspension, or a solution-suspension of promanide in an innocuous substance of slow absorption (like, for example, poppy-seed oil—if promanide should prove soluble in such a medium) offer a means of attack on the lesions in the lung? It would, of course, be necessary for this purpose to find a solvent which would be of sufficiently low viscosity to permit of effective nebulization.

Perhaps cases undergoing external drainage of lung cavities by the Monaldi method would benefit by the introduction of promanide preparations directly into the cavity through the draining catheter. It may be, too, that the introduction of promanide into lung cavities without drainage would prove of benefit, particularly if this could be done with cavities of the closed type, when substances introduced would not be expelled by coughing. Certain types of lupus might also lend themselves to treatment by promanide, particularly the ulcerative type. And what is there to lose by trying preparations of the drug in cases of tuberculous meningitis, and introducing it for this purpose into the cerebrospinal fluid?—I am, etc.,

T. FRANCIS JARMAN.

*** As was pointed out in a footnote to the article by W. H. Tytler and A. D. Lapp, the drug under discussion is known as "promin" in the U.S.A. and in this country is now marketed under the name of "promanide."—ED., *B.M.J.*

Pasteurization of Milk

SIR,—Dr. A. H. Macdonald (Jan. 9, p. 52), writing on this subject, quotes a county medical officer as preferring raw to pasteurized milk. I, too, can cite one, perhaps the same, person who took a strong line against pasteurization *until* a child of his slowly succumbed to abdominal tuberculosis. His last word to me on the subject was: "My child was murdered by the farmers."

Can parents afford to wait for the much-desired time when all raw milk is rendered safe by the slow elimination of disease in cattle? Should they not rather demand instant security by a tightening up of the process of pasteurization so that once again it is adequately performed and reliable?—I am, etc.,

Northwood. ESTHER CARLING.

SIR,—Dr. A. H. Macdonald (Jan. 9, p. 52) states: "Sir Frederic Still on Dec. 28, 1938, wrote me: 'I think in several ways raw milk is to be preferred to pasteurized milk if only we could exclude infection in raw milk.'" Now, Sir, I enjoyed the friendship of Sir Frederic Still for forty years, and we did a good deal of work together with milk and wheys, and from what he repeatedly told me he dreaded the danger of tuberculous infection being conveyed to children through infected milk, and he advised pasteurization or boiling of all cows' milk before use. He was never tired of telling the story of a lady who consulted him before the last war and who was taking her child to a farm to convalesce after a digestive upset. He informed her that the danger from tubercle in cows' milk was so real that it was essential that all milk given to the child should be first pasteurized or brought to the boil. When she arrived at the farm she saw a cow with such a gentle face that she decided not to have the milk boiled. Three months later the child, previously free from tuberculosis, died from that disease, and a melancholy but now wiser mother was heartbroken at her neglect of the advice given. The cow referred to was killed and found to be riddled with tuberculosis. —I am, etc.,

London, W.1. BERNARD MYERS.

SIR,—Lord Woolton, Minister of Food, has taken prompt measures to guard against the menace to public health of our milk supplies by consulting with milk interests as to a proposal requiring milk retailed in large cities to be heat-treated prior to delivery. Lord Woolton has thereby given his countrymen another example of his high practicality in statesmanship, and he is to be congratulated on a step which will prove of great service to public health, and remove one of the major causes that has been allowed to menace it far too long.

It is always to the good to have a lively and courageous opposition, even if it is to persuade us to swallow our milk with all its filth and latent possibilities! It is, at least, a caveat to the cocksure, and thereby has its uses. It has been a source of amazement to me that despite all the trouble and pains of zealous inspectors and watchful committees, milk production remains in such an unsatisfactory state, and so far removed from the goal of an abundant and really wholesome supply of this important commodity.

Farmers have complained to me that having taken infinite pains to secure healthy animals, clean and hygienic byres, and the milking technique carried out with the garb and zeal of a surgical operation, their product is carted off to the depots and mixed up with all "the rest." If this is really so, it is discouraging to the idealist to live up to any sustained standard of zeal, and makes one despair, despite all the fiats and fuss, of ever securing more than a poor average. As matters stand to-day nobody could persuade me to drink a glass of milk that had not been adequately heat-treated—and so say most of us who know anything about it.—I am, etc.,

Bournemouth. J. ROSS MACMAHON.

SIR,—Some correspondents are not clear as to the meaning of "pasteurization." There are two processes: (1) the "holder" process—milk to be kept at 145 to 150° F. for 30 minutes and then immediately cooled to 50° F.; (2) the "high-temperature short-time" process—milk to be kept at 162° F. for 15 seconds and then immediately cooled to 50° F. Only milk treated by one of these processes can be called "pasteurized." The "flash" process for improving the keeping qualities of milk is undefined and is not "pasteurization." Tubercle bacilli are killed if kept at 60° C. (140° F.) for 30 minutes. It is worth noting that T.T. milk may not contain more than 200,000 bacteria per c.cm., whereas pasteurized milk may not contain more than 30,000 bacteria per c.cm. In connexion with milk the word "clean" is relative, and does not mean sterile. An infected milk can be "clean," and a dirty milk may be sterile after boiling.

Are there any figures for the percentage of cows infected with tuberculosis, and the number of epidemics spread by pasteurized milk? Have controlled and properly conducted

experiments demonstrated the presence of tubercle bacilli in properly pasteurized milk?

Finally, one correspondent writes of water-borne typhoid epidemics as being accidental, but if a water supply shows faecal contamination such an epidemic is not accidental but inevitable.—I am, etc.,

Chalfont St. Peter. H. G. WILLIAMS.

SIR,—The recent discussion on milk pasteurization is very opportune. We must all have had cases in which "glands" and vague gastro-enteric symptoms have developed in children a few months after taking school milk. Some parents having paid specially for T.T. or pasteurized milk used it in large quantities with excellent results, only to be confronted later with gland trouble after the children had started school milk; in consequence they became afraid of all milk and absolutely forbade it altogether. Not only is the milk itself in question, as is shown by its going sour overnight, but the whole of its distribution—dirty bottles left on the roadside for dogs to use as lamp-posts, dirty hands on full bottle necks, and dirty tools to uncap them, also dirty straws to suck it with. Both the public and ourselves would benefit by a full discussion of the whole milk question.—I am, etc.,

Peterborough. A. M. PILCHER.

SIR,—It is fairly obvious that the opposition to pasteurization of milk is of the same nature as that which Jenner and Lister had to face, and argument is unlikely to convert the opponents. It must be admitted, however, that inefficient pasteurization is worse than none, and the necessary skilled supervision is hardly possible in small undertakings. After seeing a modern plant in operation I am satisfied that with proper methods the taste of the milk is unaltered and the vitamin content probably uninjured. In any case it would require a lot of vitamins to compensate for a few living tubercle or abortus bacilli. The time is, however, hardly ripe for compulsory measures.

Recognizing this, the Health Committee of this town formulated a scheme for establishing a pasteurizing plant under the control of the medical officer of health and with provision for bacteriological examination, etc. Producers were to deliver such proportion of their milk as they thought fit and to receive back an equivalent quantity pasteurized efficiently. They could then deliver either raw milk or pasteurized as the customers preferred; supplies of unsatisfactory quality would not be accepted for treatment. Inquiry was made as to whether the Ministry of Health would sanction a loan for the necessary capital expenditure, and the reply was that the council had no powers for such expenditure. Hence a promising scheme for the health of the community has had to be postponed until the pressure of public opinion compels the Government to act in the interests of public health.—I am, etc.,

Buxton. C. W. BUCKLEY.

Prophylactic Centres to Combat Venereal Disease

SIR,—May I through the medium of your *Journal* suggest the establishment of prophylactic centres throughout the country where those who have exposed themselves to the risk of having contracted V.D. could immediately attend for examination and treatment. Such a clinic was temporarily held during my tenure as R.M.O. at the London Lock Hospital, and fully justified, in my opinion, its establishment.

Subject to the decision of a body of eminent venereologists such a routine course might consist of: (1) urethral irrigation with approved bactericidal solutions whose adequate strength had been prescribed by a recognized central authority; (2) intramuscular injection of soluseptasine; (3) cleansing of the external genitalia with a solution of mercury biniodide 1 in 10,000; (4) these measures to be conducted under the supervision of a nurse or orderly trained in venereology, whose responsibility it would be to enter full particulars of all cases and to refer these subsequently to a medical officer for the routine tests.

The public have been so well informed of the dangers of promiscuity that I find they are now apprehensive and seek advice more readily than before. This especially applies to members of the Forces, who prefer to consult a civilian practitioner rather than their own M.O. This is my experience, which, I feel sure, is shared by my colleagues in private practice. The argument that such centres would serve to encourage promiscuity is, in my opinion, fallacious, as men and women are well aware of the gravity of the disease, and realize that the serious increase in its incidence justifies preventive measures being taken immediately, rather than to await the disease becoming established during a period which permits of other individuals having become infected.

By these methods I feel convinced that the rise in venereal disease would rapidly fall, and the large expenditure necessitated by the maintenance of venereal clinics would be considerably reduced. Here, surely, prophylaxis is better than cure.—I am, etc.,

London, W.1. E. SUTHERLAND-RAWLINGS.

Treatment of Small-pox

SIR,—Referring to the communication of Col. S. G. S. Haughton (Dec. 19, p. 736) regarding the above, I beg to say that I dealt with an outbreak of this disease in 1902-3 and treated about 150 cases. The method of treatment adopted was the careful application to the vesicles and pustules of pure liquid carbolic acid by means of a very small camel-hair brush, and the results obtained were marked. It shortened the attack by causing the pocks to dry up. In all cases it modified, and in most cases prevented, the development of secondary fever, and obviated the usual fetid odour peculiar to this disease. It diminished the subsequent pitting and shortened the stay in hospital by 10 or 12 days. Several medical men tried this method of treatment and published their results, which confirmed these conclusions. One medical officer recorded that in his opinion it was the most efficacious treatment yet introduced.—I am, etc.,

Edinburgh. JAS. T. NEECH.

Treatment of Chronic Ulcerative Colitis

SIR,—In diseases of unknown origin, and particularly in those like ulcerative colitis whose natural history runs a variable and unpredictable course with occasional spontaneous remissions, it is often possible to support a number of theories of causation with quite an array of evidence, though all the theories in question may prove later to be mistaken. Even a bacteriological cause in ulcerative colitis is not generally admitted, but I should like here to draw attention to the possible importance of anaerobic infection as a factor.

Perhaps the best-known organism to be incriminated is Bargen's coccus,[1 2] and it is stated to be oxygen-shy. More striking perhaps is the work of Dack, Heinz, and Dragstedt,[3] who investigated the organism in the colons of three patients who had undergone ileostomy and in whom "the organisms of the faecal current were therefore absent." In them the flora were "predominantly anaerobic," and two anaerobes were common to the three patients—a streptococcus, and another organism which was later described by the same authors as *Bacterium necrophorum*.[4]

On the treatment side Lynch and Felson[5] got the best effects by irrigation from oxidizing agents—potassium permanganate, hydrogen peroxide, and chloramin-T—and later Felson[6] claimed "encouraging results" from the introduction of oxygen gas into the colon. During recent years I have treated a dozen or more cases with enemas of a 5 or 10% freshly prepared suspension of zinc peroxide, usually given every second day. The foot of the bed is raised to encourage retention so long as possible, and a little belladonna added when the colon is irritable. Some cases have appeared to derive great benefit.

Against this background, I was interested in Dr. H. Neumann's article (Jan. 2, p. 9) reporting benefit from treatment by pneumoperitoneum, and I wonder whether this might be due to raising the oxygen tension of the tissue fluids in the bowel wall during absorption of the oxygen. I have tried oxygen breathing without result, but it is impossible to increase the oxygen in the tissues to any great extent by this method, and I should like to learn from physiologists as to the feasibility of treating patients in an atmosphere of oxygen in a pressure chamber.—I am, etc.,

Birmingham. J. W. RIDDOCH.

1 Bargen, J. A. (1924). *J. Amer. med. Ass.*, **83**, 332.
2 —— and Logan, A. H. (1925). *Arch. intern. Med.*, **36**, 818.
3 Dack, G. M., Heinz, T. E., and Dragstedt, L. R. (1935). *Arch. Surg.*, **31**, 225
4 —— —— —— (1936). *J. Amer. med. Ass.*, **106**, 7.
5 Lynch, J. M., and Felson, J. (1925). *Arch. intern. Med.*, **35**, 433.
6 Felson, J. (1931). Ibid. **48** 786.

Preparation of the Hands for Operation

SIR,—Prof. G. Grey Turner's interesting account of preparation of the hands in the middle 'nineties (Jan. 9, p. 53) vividly recalls to me our varied methods of those pre-glove days. At Guy's, Howse, for whom I dressed, used to encourage us first to clean our fingers with full-strength liquor potassae and then to soak the hands for some minutes in carbolic lotion, 1 in 40. His results were uniformly good, and so were Galabin's, who pinned his faith on 1 in 1,000 perchloride of mercury, without the liquor potassae. Horrocks, another successful abdominal surgeon, used to open a bottle of Martell's 1 or 2 star brandy—7s. 6d. in those days—and he and his first assistant soaked their hands in it before proceeding to the mercuric lotion. After working under Horrocks I served as house-surgeon to W. J. Gow at the Royal Waterloo Hospital, who used carbolic 1 in 40 after a short soak in 1 in 20, and, in consequence, our hands were always as rough as files. We used to sterilize the marine sponges mentioned by Prof. Grey Turner—and I echo his regret—by soaking them throughout the previous night in 1 in 20 carbolic. However, while Gow's house-surgeon I heard him read a paper on a series of 50 consecutive ovariotomies, all completely satisfactory, in 1896. One well-loved and distinguished Guy's surgeon of this period had a most annoying run of bad luck, which he stopped by burning all his kid gloves.—I am, etc.,

Southsea. M. ASTON KEY.

SIR,—Forty years ago, before gloves came into general use at operating, much interest was taken in the questions of disinfection of the hands before operations and the general care of the hands. Most surgeons had some special technique, with or without scentific basis; many had fads. Measures intended to protect the hands from septic contact extended in some individuals to the ordinary personal sanitary procedures. A great wealth of literature, good and bad, especially in German, existed. The German *Surgical Year Book* (Hildebrand, *Jahresbericht über die Fortschritte auf dem Gebiete der Chirurgie*) devoted a special chapter each year to the subject.

Behind the cover provided by rubber gloves the present generation of surgeons has not been scientifically interested in the bacteriological state of its hands. Should the dearth of rubber become more acute it may well be that, of necessity, operations will be carried out with ungloved hands. Should that position arise, may I put forward the suggestion for consideration that scientifically it may be found desirable to use the gloves which may be available for the "dirty" cases, so to minimize septic contamination of the skin of the hands. Care of the hands and disinfection of the hands are complementary aspects of the one problem. They cannot be separated. The problem is urgent and demands immediate and serious consideration. Scientifically we are back where we were at the beginning of the century.

As a basis for any such consideration may I direct attention to a small book, the best with which I am acquainted in English? It is probably out of print. It is *The Sterilization of the Hands: A Bacteriological Inquiry*, by the late Charles Leedham-Green of Birmingham (publishers: London, Simpkin, Marshall, Hamilton, Kent & Co., Ltd.; Birmingham, Cornish Brothers, Ltd., 1904)—a really excellent "objective" bit of work. Even if out of print, copies will probably be found in libraries. The book includes a remarkably full bibliography. I have no books available for reference so I cannot give further information, but there was a full-dress debate on the subject in the Section of Surgery at the B.M.A. Meeting at Oxford in 1904 and another at the Birmingham Meeting, Section of Surgery, in 1911. Detailed information will be found in the proceedings, which will be still available.—I am, etc.,

Marton in Cleveland, Yorks. W. S. DICKIE.

Pancreatitis as a Complication of Mumps

SIR,—Pancreatitis is a very rare complication of mumps. Some paediatricians confess never to have seen a case. I remember one case in a girl of 10 many years ago. As cases of mumps do not congregate in fever hospitals as do other infectious diseases, and some cases, especially the mild ones, may remain undiagnosed, it is difficult to get an opinion about the frequency of this complication. It is said by some authors to be more frequent in some epidemics of mumps. In this connexion and in view of the prevalence of mumps at the present time it may of interest to report the following case.

On Dec. 14, 1942, I was called to a girl of 6 years suffering from mumps. She showed a slight swelling on the left side of the face, and developed a swelling on the right side later with very mild general malaise. On Dec. 22 I was called again to the child. The previous day she had started to complain of pains in her abdomen and sickness. She refused food, even fluids. The pains had grown worse during the night. In the morning she was constantly sick, and had been constipated for the last 24 hours. The little girl, whom I knew to be a very vivacious but not nervous child and talkative even when she had a high temperature, was lying in bed without taking any interest in her surroundings. She was pale, her face drawn, and she was moving about restlessly from one side to the other. The hands and nose were cold. She reminded me at first sight of certain cases of toxic diphtheria with severe affection of the myocardium. But throat and nose were normal, the liver was not palpable, and the heart did not appear enlarged. The temperature was 99.4° and the pulse 92. The tongue was coated, but moist. She complained of pains in her abdomen, and indicated the regions above the umbilicus. On examination there was marked tenderness in the epigastric region, more so on the left side. The right hypogastric region was not tender. There was muscular resistance in the epigastric region. She was sick during the examination. To exclude an intestinal obstruction I ordered an enema, which had a normal result. The stool was of normal colour. In the evening the general condition had improved, but she still refused food except a little water with glucose. She had been sick again. The temperature was 99° F. and the pulse 90. The tenderness appeared to be less marked; urine had not been passed since the previous evening. The next day her condition had improved considerably. She was taking light food and had not been sick again. There was still slight tenderness in the epigastric region. The urine was light in colour; albumin and acetone negative; no casts; the Benedict test showed green turbidity, but the precipitate did not turn yellow after 10 minutes. Recovery was uninterrupted.

The course of pancreatitis in conjunction with mumps is generally a mild one, and the symptoms often subside quickly. Its nature and causation are still unknown. Pancreatitis is known to precede the swelling of the parotid glands.—I am, etc.,

London, W.9. F. MULLER.

Unwarranted Cardiac Invalidism in Children

SIR,—In a very interesting article on mitral systolic murmurs (Jan. 2, p. 8) Dr. William Evans says: "The need to recount the special features which characterize mitral murmurs receives emphasis in several departments of medicine to-day. Thus, in children the incidence of an innocent systolic murmur is high, and a faulty interpretation of this auscultatory sign is commonplace, condemning many of them unnecessarily to a life of semi-invalidism; routine medical examination of school children has inevitably subscribed to this episode. It should be a rule that no child is denied games and the healthy activities inseparable from a happy school life on account of a heart murmur of doubtful significance. Directly this suspicion has rested on a child arrangements for a special examination at a cardiac centre should operate automatically. Only in this way can unwarranted cardiac invalidism in children be avoided. Again, a young subject during convalescence from acute rheumatism is often confined to bed for several months because an innocent systolic murmur has been regarded as evidence of endocarditis or as a sign of mitral disease." Members of the Public Health Service engaged in school medical work will agree that Dr. Evans has called attention to a problem of first-class importance in the child life of the country. Whether they will feel disposed to agree with his suggested remedy is doubtful. My experience does not support his claim that unwarranted cardiac invalidism is avoided by attendance at a cardiac centre. On the contrary, such attendance is liable to confirm the invalid attitude of both child and mother.

Pari passu with the diminished incidence of juvenile rheumatism and heart disease in the last 40 or 50 years (thanks to social amelioration) there has been a remarkable growth in professional interest in the subject, culminating in the rise of "juvenile rheumatology" to the status of a special branch of paediatrics, and in the establishment by voluntary organizations and some public health authorities of "rheumatism supervisory schemes," including special clinics, schools, heart homes, and other arrangements for prolonged rest and convalescence.

Meantime birth control has resulted in much fewer but much more precious children, with a corresponding increase in

maternal anxiety for the welfare of the individual child and a craving for medical examination, advice, and guidance in his upbringing. In these circumstances the mention of "rheumatism" or "heart disease" is never without danger. Yet it is, in my experience, not uncommon to find these labels attached to children in whom I fail to find any history or signs or symptoms of these diseases. Sometimes the diagnosis has been made by the family doctor, sometimes by the school doctor, but quite often by a "specialist" at a rheumatism supervisory centre. When the label is attached by a specialist it has, quite naturally, greater significance in the minds of the parents and is correspondingly difficult to detach.—I am, etc.,

R. P. GARROW,
Medical Officer of Health.

Crouch End, N.8.

Adoption of Children

SIR,—My council is gravely concerned about the increasing number of adoptions which are being arranged, often without any proper safeguards, by private individuals, among them doctors, midwives, nurses, health visitors, and workers in Citizens' Advice Bureaux, none of whom has had the specialized training and experience essential for successfully carrying out so delicate a transaction. These persons, no doubt full of good will, think they are helping the mother (whether married or unmarried) of an unwanted infant and benefiting a childless couple, a wife whose husband is abroad on active service, or a lonely widow or spinster who wants an interest in life. We hear of infants being handed over like parcels at railway stations to persons about whom little or nothing is known by the no doubt kind-hearted intermediary, or of the arrival of such infants in completely unsuitable homes. To secure success in adoption long, patient, and skilled inquiries are essential; not only physical but psychological conditions need the most careful consideration. We wish to urge such intermediaries, with all the earnestness that we can command, to refer would-be adopters and parents of unwanted children to the established reputable and experienced adoption societies. These workers, through long experience, may hope to fit the right child into the right home, and thus avoid the creation of social wreckage and the causing of childish unhappiness which does not bear thinking about.

If and when the Adoption of Children (Regulation) Act comes into force many of the worst of these dangers to unwanted children will be safeguarded. Until that day we fervently beg all those interested to avail themselves of the services of trained workers and established organizations. Adoption may, and should, bring blessing and happiness to child and adoptive parents; it may, and too often does, produce results exactly the opposite. The unwanted child is the most helpless of human beings; let us bring to bear upon its problem all the skill at our command.—I am, etc.,

LETTICE FISHER,
Chairman, National Council for the Unmarried Mother and her Child.

117, Piccadilly, W.1.

Education Grants for Doctors' Sons

SIR,—I shall be grateful for space in your columns to make it generally known that under the will of Mrs. Emily Wilson Barkworth grants can be made to the sons of Fellows and Members of the Royal College of Surgeons who need financial assistance to meet the cost of their education at Winchester College. The number of candidates so far has not been sufficiently large to encourage the trustees to think that this limited application of the funds at their disposal will lead to a sufficient use being made of the income of the trust. They are, therefore, considering whether they should apply for permission to make selections from a wider field. The Council of the Royal College of Surgeons is anxious that Fellows and Members of the College should be aware of this generous bequest, and that, before consenting to any enlargement of the field, it can be certain that the applications from Fellows and Members are not likely to be sufficient to ensure full and satisfactory use of the trust. I shall, therefore, be grateful if Fellows and Members who are anxious to take advantage of this bequest will communicate with me at their earliest convenience.—I am, etc.,

ALFRED WEBB-JOHNSON.

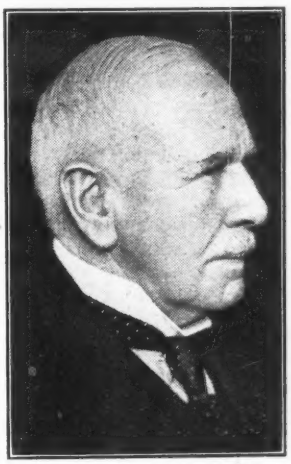
Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2.

Obituary

SIR W. ARBUTHNOT LANE, BT., C.B., F.R.C.S.

Consulting Surgeon, Guy's Hospital

Bygone controversies will be recalled—but not revived—by the announcement of the death of Sir Arbuthnot Lane, which took place on January 16. An Irish ancestry and a Scottish upbringing combined to produce a combative and tenacious personality, partly concealed, but made more dangerous to opponents, by a mild and persuasive exterior. A man of undoubted gifts and insight, he seemed to take pleasure in the expression of extreme views, in season or—preferably—out of season, believing probably that by the clash of extremes a true balance can be maintained.



[*Press Portrait Bureau*

William Arbuthnot Lane was born in Scotland in 1856, the eldest son of Brigade Surgeon B. Lane, an Irish military surgeon. He was educated at Stanley House, Bridge of Allan, and received his medical training at Guy's, taking the M.B., B.S. of London, with the gold medal in anatomy and medicine, in 1881, and the F.R.C.S. in the following year, when he was only 26. The first of his innumerable publications dates from 1883, when he contributed to the *Transactions* of the Pathological Society of London a paper on fractures of the sternum, and to *Guy's Hospital Reports* on cases of empyema in young children treated by removal of a portion of the rib. His early work was almost entirely in bone surgery. He was interested in the human skeleton, its congenital deformities, the extent to which it is prone to accident, and its variations under pressure. He wrote extensively on such anomalies as cervical rib and sixth lumbar vertebra, also on knock-knee, flat-foot, and rickety changes in the spinal column and pelvis, and again on the changes produced by pressure—pressure changes in the skeleton revealing the labour-history of the individual, abnormal mechanical conditions of the hip-joint, the anatomy of the charwoman and of the cobbler, the effect of the corset on the abdominal viscera, and of the body on the mechanics of the foot. He once boasted that he could tell in the dissection room from the examination of the body of a manual worker what occupation he had followed during life. All these matters interested the young Lane. He saw the skeleton as representing the crystallization of lines of force. His belief was that the body bears certain mechanical relationships to its surroundings, and any change in those relationships has a corresponding effect on the anatomy, so that everything that Nature does to meet such an alteration in the mechanical relationships tends to shorten life.

As early as 1884 we find his name attached to nineteen papers in the medical journals, almost all of them dealing with fractures and deformities. These included an account of the abnormalities observed in the dissection room at Guy's, an annual review in which he collaborated during several years with Dr. (later Sir William) Hale-White. The earliest of many papers published in this *Journal* appeared in 1887 (**2**, 119). With the surgical department of Guy's his name was linked for half a century. He was also surgeon and later consulting surgeon to the Hospital for Sick Children, Great Ormond Street. His reputation rapidly grew, and some of the surgical procedures which his agile and emancipated mind thought out gained wide acceptance; his wonderful dexterity and surgical skill compelled the admiration of all. In the early 'nineties he was criticizing the splints then in use in fracture cases as likely to produce permanent injury and was anticipating to some extent the modern treatment of fractures. In 1893 he drew attention to the advantages of the steel screw in the treatment of fractures

which failed to unite. His operation for cleft palate, introduced at the beginning of the present century, was widely followed.

It appears to have been about 1903 that Lane first published his views on the effect on general health of chronic obstruction of the large bowel, and from that time onwards his voice and pen never wearied in proclaiming that constipation was answerable for much of our disease and could be corrected by healthy habits of living. Practically all chronic diseases, he said, were merely symptoms or manifestations of intestinal stasis. So closely was his name attached to this doctrine that "Lane's disease: intestinal stasis" will be found in the medical dictionaries, as well as "Lane's operation: short-circuiting of the large intestine for chronic obstruction." His book *Operative Treatment of Chronic Constipation* appeared in 1904, and his printed papers and lectures on that theme from then onwards number at least fifty. Again and again he denounced the assumption in civilized communities that one action of the bowel a day was quite enough for health. Such assumption, he said, resulted in "constipation for twenty-four hours." If people would revert to the habit of "three motions daily," then many diseases, among them cancer, really due to intestinal stasis, would disappear. Such was the gospel he preached with the fervour of an evangelist,

The "kink of the ileum," which became known, perhaps with a little derisory significance in some quarters, as "Lane's kink," first appears in the title of a paper by him in 1910. By the "kink" he meant the anchoring of the iliac colon by the formation of thin bands or tags of peritoneum arising as a result of the excessive strain caused by the accumulation of faecal matter in the pelvic colon. This anchoring of the iliac colon, he exclaimed dramatically on one occasion, spelt the failure of civilization. He felt so strongly on this and other health questions that he did not hesitate to use the lay press —including the most widely circulated newspaper at that time —to bring them before the public. He was impatient at the lack of emphatic endorsement of them by the profession in general, and there were those who rebuked a man of such eminence for encouraging by his example doctors who courted the lay press for purposes of self-advertisement. There came a day when, as a protest, he resigned from the British Medical Association and founded the New Health Society. It was an unhappy controversy about which there is no need to say more. Sir Arbuthnot Lane's provocative statements always furnished "copy," as, for example, that "A glass of beer is better than a pint of tea," and "That which is universally accepted as true in medicine is almost always wrong." Even his platitudes were widely quoted; for example: "The future of the race is in the hands of our women." Not infrequently he castigated his own profession. In a speech at the R.S.M. in 1922 he declared that colectomy was necessary because of the hopeless ignorance and incompetence of the physicians. He would describe humorously how patients came to him and told him that a doctor had said to them, "For goodness' sake don't go to Lane. Whatever is wrong with you, even if it is only a sore throat, he will take out your colon." The controversies that he gathered round him made no difference to the affection in which he was held by Guy's men and many others, and in personal contacts nobody could be more charming.

Enough has been said already about Lane's frequent contributions to literature. Among the books which bear his name, in addition to *Operative Treatment of Chronic Constipation*, already mentioned, were *Cleft Palate and Adenoids* published in 1897, and *Operative Treatment of Fractures* in 1907. He was part-author of Carrington's *Manual of Dissections of the Human Body*, and author of the section on diseases of muscles and tendons in Treves's *System of Surgery*. A bibliography of his writings extending from 1883 to 1938 contains nearly 400 entries.

Lane was made a baronet in 1913. He was also Chevalier de la Légion d'Honneur. He married in 1884 Charlotte, daughter of John Briscoe. In 1935 he married, secondly, Jane, daughter of the late Mr. N. Mutch. His son, William Arbuthnot, succeeds to the title. Of his three daughters, the eldest took up a scholastic career, and achieved high distinction in the educational world. The other two daughters married members of Guy's staff, one becoming the wife of Mr. Harold Chapple, senior obstetric surgeon to Guy's, and the other the wife of Dr. Nathan Mutch, physician to the hospital.

Mr. H. L. EASON writes: Arbuthnot Lane will always be remembered at Guy's Hospital as the surgeon who first brought into practice the strict principles of aseptic surgery. These, combined with his uncanny dexterity and technique, made his unusual reputation while he was still a young man. His confidence in his own powers and in his own opinions made him an inspiring teacher and sometimes a combative critic of others. Unfortunately, others not endowed with his technique, and seeing the simplicity with which he appeared to do the most perilous things, tried to copy him, sometimes with unfortunate results. Of his work generally as a surgeon I am not competent to speak, but my memory reminds me, away from all records or dates, of two operations I saw him perform in 1897 or 1898. The first was his first treatment of a fracture by screws. It was a spiral fracture of the tibia, and Lane sent for one or two ordinary steel screws from the carpenter's shop and screwed the fracture right through the bone. Plating was, of course, a much later development. The second operation was for a large volvulus of the colon in a middle-aged woman. It measured about 25 inches in length and the colon was 11 or 12 inches in circumference. On the abdomen being opened the volvulus shot out and stood up like a bicycle tyre. Lane looked at it and said, "The only thing to do is to cut it all out." He therefore resected the whole volvulus, and the woman made a good recovery. The success of this operation probably suggested to his mind the possibility of his later, though possibly misguided, operations for resection of the colon. But, as has been said above, his unparalleled technique enabled him to do things with success which other men failed to do.

He was an Irishman, and he certainly had the faculty of trailing his coat-tails. In conversation he was difficult. Many people could find nothing to say to him, and he on his part had little to say to them except on the weather, and that in unstimulating phrases. His influence over his house officers and students was immense; but whether that influence was always to the good, in that they thought that what he did and preached they also could do and preach, the historian of surgery must decide. On the balance, however, he was a great surgeon, a brilliant pioneer, and a great teacher, the most distinguished Guy's surgeon of this generation.

G. W. CRILE, M.D.

We regret to announce the death on Jan. 6 at the age of 78 of Dr. G. W. Crile, Director of Research at the Cleveland (Ohio) Clinic, of which he was one of the founders.

George Washington Crile was born in 1864. He was educated at the Ohio Northern University and Wooster University (now Western Reserve University), and studied abroad in Vienna, London, and Paris. He received many honorary degrees, including the M.Ch. of the University of Dublin and the LL.D. of Glasgow. Dr. Crile was in turn lecturer and demonstrator in histology, professor of physiology, and professor in the principles and practice of surgery at Wooster University, and in 1921 played an active part in founding the Cleveland Clinic Foundation. He served as a brigade surgeon in the Spanish-American War in 1898 in Cuba and Porto Rico. In the 1914-18 war he saw service in France as Director of U.S.A. Base Hospital No. 4, Lakeside Unit; in 1919 he received the C.B. (Honorary Member, Military Division, 3rd Class), and in 1922 was made Chevalier, Légion d'Honneur. Dr. Crile was a member of many professional and scientific societies, and received several prizes and medals in recognition of his contributions to medicine. Among his publications were works on *Surgical Shock* (1897), *Haemorrhage and Transfusion* (1909), *Anoci-association* (with Lower, 1914), *Origin and Nature of the Emotions* (1915), and *The Surgical Treatment of Hypertension* (1938).

For the following appreciation we are indebted to Sir WALTER LANGDON-BROWN:

George Washington Crile's earliest work to command attention was concerned with anaesthetics, and he was one of the pioneers in blood transfusion. The conditions calling for this procedure naturally turned his mind to the study of shock. In the course of these researches he, like W. B. Cannon, turned W. H. Gaskell's great work on the sympathetic nervous system to admirable clinical use. In the retrospect it is curious to

observe the lengthy time-lag between the physiological discoveries and their practical application. Cannon pointed out that the effects of sympathetic stimulation were all originally designed to activate the body for a struggle and to increase its power of defence. Crile went on to show how under less primitive conditions these effects, failing to find their appropriate motor outlet, produced perturbations which are so often mistaken by the sufferer for symptoms of organic disease. "Men's fear," he said, "is manifested in terms of his ancestral physical battle in the struggle for existence. He cannot fear intellectually, he cannot fear dispassionately; he fears with all his organs. . . . Nature has the one means of response to fear . . . it is always physical. Under modern conditions of life neither fight nor flight is *de rigueur*. The individual under the influence of fear may be likened to an automobile with the clutch thrown out but whose engine is racing at full speed." And so in this vivid way he focused attention on the physical manifestations of psychological disturbances. Closely linked with this was his theory of "nociceptor," a view recently extended by Sir Thomas Lewis to include other receptors of painful stimuli. The nociceptor may be defined as the nerve-endings which through their sympathetic reverberations initiate a degree of shock often incommensurate with the severity of the lesion. Crile pointed out the instructive way in which animals engaged in mortal combat tried to seize on those areas of the antagonist most plentifully endowed with nociceptors. These are the views which attracted most attention to his work. He did not discover adrenaline as has been stated; Schäfer and Oliver, as is well known, first prepared a potent extract from the adrenals, from which Takamine isolated adrenaline. Langley pointed out that it had the same effect as stimulating the sympathetic, and Crile seized on that idea, making use of adrenaline as a direct stimulant to the accelerator nerves of the heart—e.g., in collapse under anaesthetics. Some of Crile's later ideas found less general acceptance, but the work of his middle period has already passed into the general stock of medical ideas, even if their origin has been forgotten.

ROBERT BOYD, M.D.GLAS.

The death of Dr. Robert Boyd came as a great shock to his many friends in Manchester, and not least to members of his own profession, for whom he had done so much good and useful work.

Born in 1872 at Barr in Ayrshire, Dr. Boyd was educated at the Ayr Academy and at Glasgow University, where he took the M.B., C.M. in 1893, later proceeding to the M.D. After qualification he spent some years in house appointments, notably at Huddersfield. Later he served in the South African War, and in 1903 settled in Manchester. Here his absorption in his profession and his tremendous capacity for work soon ensured a large and busy practice, in which he was actively engaged to the time of his last illness. His chief hobbies, apart from his daily work, were the B.M.A. and local medical affairs, and the high esteem in which he was held by his professional brethren was well shown by the offices to which they elected him. He was chairman of the Manchester Division for 2 years and vice-chairman for 8; a member of the executive committee from its inception in 1915; a member of the Panel Committee from its start in 1913, and vice-chairman for 12 years; and a member of the Branch Council for 20 years. Centrally he was a Representative for 20 years, being particularly concerned with the welfare of the family doctor, and proud to have taken an active part in starting the General Practice Committee, of which he became a member. For the last four years he was a member of the Insurance Acts Committee, having also served on the Hospitals Committee. Quiet, unassuming, never seeking the limelight, Boyd was a man of whom his profession may feel justly proud. By patients and colleagues alike he will be sorely missed.

We regret to announce the sudden death of Dr. GEORGE KENWORTHY THOMPSON at Derby on Dec. 26. Born in 1887, Dr. Thompson was educated at Uppingham School and Manchester University, where he graduated M.B., Ch.B. in 1911 and in 1914 obtained the D.P.H. He held several hospital appointments after graduating, and was assistant tuberculosis officer in Cheshire before joining the R.A.M.C. in 1915. He served in Gallipoli, Mesopotamia, and India, and on returning to civil life in 1919 became chief assistant medical officer of health in Derbyshire. He resigned this post in 1921, and from then until 1940 he was in general practice, first at Sedbergh, then successively in Cheshire, Essex, and at Coventry. Throughout this time, however, Dr. Thompson maintained a lively interest in public health activities, and he continued to hold various appointments with local authorities. When he left general practice in 1940 he became assistant medical officer of health in Derby. He was in Derby and then Mansfield for some time, and ultimately held the post of assistant medical officer of health for Northamptonshire. He had been a member of the B.M.A. for 30 years. Dr. Thompson was popular with staff and patients alike, and his untimely death will be regretted by a wide circle of friends. He is survived by a widow and three daughters, one of whom, Dr. B. Mary Thompson, is serving in the R.A.M.C.

In the *Journal* of Aug. 8, 1942 (p. 177), we published a brief obituary notice of Temp. Surg. Lieut. Eric Beresford Riding, R.N.V.R. We have now received the following appreciation from R. H. R.: Riding was a delightful companion, having a ready wit and a remarkable art of mimicry. Any function he attended was bound to go with a swing. He played soccer for the university for many years and was a natural athlete. Apart from public health, in which subject he passed with distinction, he did not strive after academic honours, but he was recognized as a sound student and a trustworthy, common-sense doctor. His maritime contacts and interests were many, and, if his end had to come in this war, it is perhaps fitting that it should have happened at sea.

The Services

Capt. G. O. Brooks, G.M., and Lieut. F. A. Macrae, R.A.M.C., have been awarded the M.C. in recognition of gallant and distinguished services in the Middle East.

Capt. K. Mariswamappa, I.M.S., has been awarded the M.C., and Brigadier (local) B. C. Ashton and Major (temp. Lieut.-Col.) V. E. M. Lee, I.M.S., have been mentioned in recognition of gallant and distinguished services in Iraq, Syria, and Persia during the period April, 1941, to Feb., 1942.

CASUALTIES IN THE MEDICAL SERVICES

Surg. Lieut. JAMES LANGFORD BROWNRIGG MACFARLANE, R.N.V.R., was killed in action in H.M.S. *Achates* in December. He was born 28 years ago, the second son of Dr. and Mrs. J. E. MacFarlane of Whitley Cross, Reading, and received his professional education at St. Mary's Hospital, qualifying M.R.C.S., L.R.C.P. in 1941. Before entering the R.N.V.R. in May, 1942, he held the post of house-surgeon at Park Prewett Hospital, Basingstoke. He was a member of the B.M.A.

Temp. Surg. Lieut. ARCHIBALD BARR AITON, R.N.V.R., is included as "missing, believed killed" in an Admiralty Casualty List published on Jan. 13. He was born on Sept. 3, 1917, and was educated at the University of Glasgow, where he graduated B.Sc. in 1938 and M.B., Ch.B. in 1941. He had held the post of house-physician at Stobhill General Hospital, Glasgow, before entering the R.N.V.R. in October last year. His home was at Strathaven, Lanarkshire.

Col. CHARLES FRANK BURTON, M.C., who was reported missing in the *Journal* of April 25, 1942 (p. 540), is now presumed to be dead. He was born on Jan. 16, 1889, and received his professional education at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1913. He served in the war of 1914-18 in the R.A.M.C., S.R., and was awarded the M.C. in Sept., 1918, the official citation reading as follows: "In his skilful leading of the stretcher-bearers on all occasions he has always shown great coolness under the heaviest fire." After the war he took a permanent commission as capt. in the R.A.M.C., was promoted major in 1926, lieut.-col. in 1938, and col. in 1941, and at the time of the Japanese invasion was holding an appointment at Singapore.

Capt. ALBERT JOSEPH ANTAKI, R.A.M.C., who is included as "died" in an Army Council Casualty List published on Jan. 15, entered the Palestine Section of the R.A.M.C. as lieut. in July, 1941, and was promoted capt. a year later.

Prisoners of War.—Major F. W. Allinson, I.M.S., Capt. R. W. W. Brown, R.A.M.C., Capt. W. A. W. Chapman, R.A.M.C., Capt. A. W. Chester, R.A.M.C., Temp. Lieut.-Col. G. F. A. Condon, I.M.S., Capt. A. H. R. Coombes, R.A.M.C., Capt. J. A. Falk, R.A.M.C., Capt. A. W. Frankland, R.A.M.C., Capt. J. A. Glover, R.A.M.C., Lieut.-Col. J. Huston, R.A.M.C., Acting Lieut.-Col. W. G. Kennedy, I.M.S., Capt. P. M. Kirkwood, I.M.S., Lieut.-Col. J. W. Malcolm, O.B.E., M.C., R.A.M.C., Capt. G. K. Marshall, R.A.M.C., Capt. H. V. Morris, I.M.S., Major T. F. O'Donnell, I.M.S., Capt. C. S. Pitt, R.A.M.C., Major J. White, I.M.S.

No. 52

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 2.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospina fever	95	5	18	2	6	95	6	31	5	8
Deaths		1	1				1	3		
Diphtheria	939	59	219	95	40	845	29	248	27	29
Deaths	29	2	3	3	—	32	—	5	2	5
Dysentery	95	14	27	—	—	93	8	5	—	—
Deaths				—	—			—	—	—
Encephalitis lethargica, acute	2	—	1	—	—	2	—	1	2	—
Deaths		—	—				1	—		
Erysipelas		—	50	11	—		—	45	4	3
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years				38						
Deaths	45	5	4	20	3	39	—	6	3	—
Measles	14,989	742	218	16	24	540	50	42	24	7
Deaths	43	1	4	—	—	2	—	—	—	—
Ophthalmia neonatorum	74	7	23	1	2	46	2	26	—	—
Deaths										
Paratyphoid fever	7	—	—	—	—	5	—	4	1	
Deaths	—	—	—		—					
Pneumonia, influenzal*	936	60	8	3	4	751	43	8	3	13
Deaths (from influenza)	44	5	3	—	—	32	1	1	—	1
Pneumonia, primary			179	28				259	12	
Deaths		43		22	7		40		17	10
Polio-encephalitis, acute	†	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	4	—	2	7	1	11	1	1	1	—
Deaths		—	—				—	—		
Puerperal fever	165	8	15	1	—	1	1	11	3	—
Deaths							—			
Puerperal pyrexia			13		2	139	10	21		2
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,159	141	287	70	61	997	28	235	25	27
Deaths	3	—	—	—	—	1	—	1	—	—
Small-pox	1	—	1		—	—	—	—		—
Deaths			—	—	—		—	—	—	—
Typhoid fever†	6	2	1	5	2	14	1	3	4	2
Deaths	—	—	—	—	—		—			
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,187	78	22	31	12	1,124	154	21	7	4
Deaths	14	2	1	2	—	8	2	2	—	—
Deaths (0–1 year) Infant mortality rate (per 1,000 live births)	409	50	48	64	38	361	43	74	29	20
Deaths (excluding still-births)	5,119	784	553	272	155	4,369	604	638	147	123
Annual death rate (per 1,000 persons living)			12·4	18·2	‡			13·9	9·8	‡
Live births	6,131	775	786	379	302	3,489	330	720	132	160
Annual rate per 1,000 persons living			16·3	25·3	‡			14·6	8·8	‡
Stillbirths	234	25	30			148	15	46		
Rate per 1,000 total births (including stillborn)			37					60		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes paratyphoid A and B for Northern Ireland.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales*, as was to be expected after the big drop in the preceding week, there was a very large rise in the notifications of infectious diseases. Measles was up by 4,101, whooping-cough by 350, acute pneumonia by 265, diphtheria by 208, scarlet fever by 105. The increase in measles and whooping-cough exceeded the decrease reported last week, but the incidence of the other diseases did not reach the level of a fortnight ago.

The incidence of scarlet fever continued to diminish in most areas, although the only decline of note was 46 cases in Yorks West Riding. The principal exceptions to the general trend were rises in Staffordshire of 81 and in London of 43 cases.

The largest increases in the notifications of diphtheria were those of London 29, Cheshire 39, and Derbyshire 36. In the last-named this was due to an outbreak in Chesterfield R.D. involving 34 people.

A small rise in the incidence of whooping-cough was general throughout the country, the largest being those of Yorks East Riding 45, Warwickshire 41, Staffordshire 37, and Essex 35.

The increase in measles began in mid-September and since then has been rapid. The cases are now five times as numerous as they were then, and have reached the highest level during the past twenty months. The largest rises during the week were those of London 442, Lancashire 417, Leicestershire 335, Essex 256, Middlesex 245, Nottinghamshire 242, Staffordshire 232, Yorks West Riding 227, Warwickshire 220. Over one-third of the total cases in the country were recorded in the two counties of Lancashire and Yorks West Riding.

There was an outbreak of 20 cases of dysentery in Derbyshire, Derby C.B., during the week. The incidence in most of the other areas fell, with the result that the total was 8 fewer than in the preceding week.

In *Scotland* there was a general drop in the incidence of infectious diseases. The cases of measles and scarlet fever were 114 and 105 fewer than in the preceding week, but in Glasgow the figure for measles rose by 5. Only 27 cases of dysentery were notified, the smallest weekly total during the recent months.

In *Eire* notifications of diphtheria and of scarlet fever were 45 and 39 more than in the preceding week.

In *Northern Ireland* there was a small but general rise in the notifications of infectious diseases.

Infectious Diseases during the Year

The past year has been notable for the large number of cases of dysentery and the very low incidence of enteric (paratyphoid and typhoid) fever. The drive for immunization against diphtheria has given disappointing results, and the total notifications were only slightly below those of preceding years. A comparison of the incidence of infectious diseases in recent years, compiled from the weekly returns in England and Wales, is:

	1942	1941	1940	1939	1938
Scarlet fever	84,932	59,111	65,573	78,201	99,413
Whooping-cough	65,563	171,406	53,403		
Diphtheria	42,318	51,091	46,683	47,910	65,720
Measles	285,300	406,507	407,908		
Acute pneumonia	42,487	50,514	47,712	42,275	45,117
Cerebrospinal fever	6,089	11,119	12,791	1,506	1,293
Dysentery	7,177	6,597	2,843	1,963	4,210
Typhoid and paratyphoid fevers	887	4,703	2,824	1,524	1,347

The incidence of cerebrospinal fever has fallen considerably, but remains at over four times the peacetime level.

Returns for the Week Ending January 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,808, whooping-cough 1,302, diphtheria 841, measles 14,153, acute pneumonia 1,091, cerebrospinal fever 87, dysentery 119, paratyphoid fever 5, and typhoid 8.

C. R. Donovan and M. Bowman (*Canad. med. Ass. J.*, 1942, **46**, 525) record their observations on encephalitis in Manitoba from 1938 to 1941 inclusive, with special reference to an outbreak of 509 cases during 1941 and a concurrent epidemic of 966 cases of poliomyelitis. During the four years serological tests were reported positive in 83 cases for Western equine virus, one for St. Louis, and one for Japanese B. The 1941 cases were distributed widely throughout the province and occurred mainly in August. About 70% were in males; 81% were 20 years old and older; 78 died—a case fatality of 15.3%.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Vice-Chancellor gives notice that the Sir William Dunn Professorship of Biochemistry is to be vacated on Sept. 30, 1943, by the resignation of Sir Frederick Gowland Hopkins, and that the Regius Professorship of Physic is to be vacated within the present academical year by the resignation of Dr. John A. Ryle.

The written part of the examination for the degree of M.Chir. will be held on Feb. 16 and 17, and the remainder on Feb. 26 and 27. R. H. A. Swain has been approved for the degree of M.D. in absence.

At a Congregation held on Dec. 5, 1942, the following medical degrees were conferred:

M.D.—L. J. Bacon, R. A. Jones.
M.B., B.Chir.—T. P. Pattinson (by proxy).

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Dr. P. R. Peacock will deliver a lecture on "Gastric Cancer: An Experimental Approach to the Problem of Causation" under the auspices of the Miss Weild Fund in the hall of the Faculty, 242, St. Vincent Street, Glasgow, on Wednesday, Jan. 27, at 4 p.m.

Medical News

Dr. J. A. Ryle, Regius Professor of Physic, University of Cambridge, has been elected Professor of Social Medicine at Oxford, with effect from April 1.

Prof. J. C. Drummond, Scientific Adviser to the Ministry of Food, will give a discourse on "The History and Knowledge of Scurvy and its Treatment" at the Royal Institution, 21, Albemarle Street, W., on Friday, Feb. 5, at 5 p.m.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, Jan. 28, at 4.30 p.m., when a paper will be read by Dr. H. E. Cox on "Recent Developments in Food Legislation."

A meeting of the Royal Sanitary Institute will be held at 90, Buckingham Palace Road, S.W., on Wednesday, Jan. 27, at 2.30 p.m., when there will be a discussion on "Healthy Housing."

The annual congress of the Ophthalmological Society of the United Kingdom will be held at the Royal Society of Medicine, 1, Wimpole Street, London, W., on Friday and Saturday, April 30 and May 1. Discussions on "Thyrotoxicosis in its Relation to Ophthalmology," to be opened by Dr. Russell Brain and Mr. L. H. Savin, and "The Scientific and Clinical Aspects of Night Vision," to be opened by Prof. W. J. B. Riddell and Air Commodore P. C. Livingston, will take place on the first and second days respectively.

The working of the Appointments System for out-patients which Guy's Hospital instituted some months ago is being hampered by doctors failing to comply with the procedure laid down. If they wish to send patients for examination they should write or telephone beforehand for an appointment with the member of the visiting staff concerned. Letters should be addressed to the sister-in-charge of the out-patient department, Guy's Hospital, London Bridge, S.E.1, telephone Hop 3500, Extension 11.

Supplies of benzyl benzoate are available for the preparation of the aqueous emulsion for the treatment of scabies, and if doctors or hospitals have any difficulty in obtaining it they should communicate with the Director of Medical Supplies, Portland House, Tothill Street, London, S.W.1, stating the quantity required monthly and the name of present or intended supplier.

Among recent activities of the Central Council for Health Education we may note the issue of a series of practical and compactly worded leaflets on various aspects of the health of the worker, under such titles as "Rest and Relaxation," "Be Kind to Your Stomach," "Care of the Feet." Industrial medical officers can obtain these leaflets and other health propaganda material by applying to the offices of the Central Council, Tavistock House, Tavistock Square, London, W.C.1.

The Council of Epsom College will shortly proceed to award St. Anne's Scholarships to girls attending Church of England schools. Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than 5 years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected. Forms of application can be obtained from the Secretary's Office, Epsom College, Surrey.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Secretary of the Journal Board, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be sent to the Secretary.

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QUERIES AND ANSWERS

Income Tax

Remittances from Abroad

A. C. N. has held an appointment under a foreign Government for 23 years. He returned to England on Oct. 23, 1941, on sick leave, and hopes to go back in the near future. He was exempt from British tax as a non-resident for 1941–2, but has been assessed for 1942–3, as a resident, on the basis of the amount of his remittances to this country in 1941–2. The 1941–2 remittances were heavy and will not recur. A. C. N. suggests that it is unfair that he should be charged 10s. in the £ on this amount when it would have been taxed at 8s. 6d. in the £ if it had been assessed for 1941–2.

*** A. C. N. has at least this advantage, that he is not liable for the first 5½ months of his stay in this country. Supposing, for instance, that he returns to his appointment in June, 1943, he will have been here for, say, 17 months, but have been liable only for the 12 months ending April 5, 1943. The basis of assessment for that year is legally the amount of the remittances received in the year previous, provided that those remittances represented income and not capital. (If the total amount remitted in 1941–2 was greater than the foreign income of that year, that point should be put to the inspector of taxes.) If the figures are such as to create peculiar hardship it might assist if the facts were put to the Secretary, Board of Inland Revenue, Imperial Hotel, Llandudno, and a request made for some equitable concession, but a departure from strict legality is not likely to be conceded.

Single Person's Liability

F. D. asks, "How much should I allow for income tax on £300 per annum, all found? I am a single woman."

*** The tax due for the year to April 5, 1943, assuming that the employment covered the whole year, is calculated as follows:

Amount of remuneration			£300
Deduct—Earned income relief	£30		
Personal allowance	£80		
		£110	
		£190	
Taxable at 6s. 6d. in the £—£165 ..... tax	£53	12	6
,, ,, 10s. ,, ,, £— £25 ..... ,,	£12	10	0
	£66	2	6

Employment—Bad Debts

W. J. is working under the B.M.A. scheme, for a practitioner who has been called up, on the basis that he is remunerated by half the profits of the practice. The inspector declines to make him an allowance for the bad debts booked but probably uncollectable.

*** The inspector is wrong. It is clear that in calculating "profits" some allowance or deduction should be made for bad and doubtful debts—that is a general commercial and income-tax rule—and as W. J.'s remuneration is measured by the amount of "profits" they should be taken into account in calculating his "share."

Fees Paid to the Royal College of Physicians

T. T. asks whether fees paid on election as a Fellow of the College are allowable as expenses.

*** No. The fees in such circumstances are in the nature of capital outlay rather than current expenses.

LETTERS, NOTES, ETC.

An Unusual Triple Complication of Pregnancy

Dr. G. P. MERSON (Zanzibar) writes: An Arab 4-para aged 35 was admitted to Zanzibar Maternity Hospital with a rather unusual history. The ante-natal period was uneventful except that hydramnios was suspected. The history given was that she went into labour at 6 o'clock in the evening with a normal show and slight loss of liquor. Next morning the membranes ruptured, with the loss of four gallons of liquor amnii. Pains continued and there was a large ante-partum haemorrhage. The midwife then examined her per vaginam. She found the placenta nearly completely separated and lying in the vagina, and a shoulder presentation with the arm prolapsed at the side of the placenta. The condition of the patient on admission to hospital was poor (pulse 110, subnormal temperature). On abdominal examination the position of the foetus was transverse, the head lying in the left iliac fossa. The placenta was hanging out of the vulva suspended by the cord, which had already been tied at the vulva. The arm was prolapsed and a hand was visible at the vulva. Although the patient's condition was poor she was still having very strong contractions at short intervals and, on account of this, immediate intervention seemed necessary. Under general anaesthesia with ether, decapitation was performed. The recovery was interrupted by the development of a small ischio-rectal abscess, which required incision. This case was interesting from the association of serious complications: (1) hydramnios; (2) central placenta praevia, with expulsion and delivery of placenta; and (3) impacted transverse lie.

Surgical Emphysema Complicating Pulmonary Tuberculosis

Dr. GERALD H. COORAY (surgical registrar, General Hospital, Colombo) writes: The case reports of Dr. T. B. L. Bryan (December 21, 1940, p. 868) and Dr. G. Hurrell (July 5, 1941, p. 16) respectively prompt me to record a similar case with the kind permission of Dr. B. E. Fernando, visiting surgeon, General Hospital, Colombo, under whose care the patient was admitted. A female Sinhalese aged 20 years was admitted to the hospital on August 22, 1941, with fever, cough, and pain in the chest of eight days' duration. She was pale and poorly nourished. Her temperature was 102° F. and the pulse rate 120. There were physical signs of a cavity at the left apex. The following day her temperature was 100.4° F., but she had suddenly developed surgical emphysema of the tissues of the upper part of the left chest. A radiograph showed a left-sided spontaneous pneumothorax. Her cough became more severe and her temperature began to vary between 99° F. in the mornings and 101° F. in the evenings. The surgical emphysema gradually spread to the tissues of the neck and face. As she was dyspnoeic surgical treatment was contemplated, but was refused by the patient. The emphysema gradually disappeared from the face and neck and her temperature began to settle down. Unfortunately, on September 1 she insisted on leaving the hospital and was therefore discharged.

Buerger's Exercises in Comfort

Dr. WILLIAM CAMPBELL (Edinburgh) writes: A patient recently treated in the wards of the Royal Infirmary, Edinburgh, by the intermittent venous occlusion machine applied to the thigh was instructed in Buerger's exercises when he was discharged. Three weeks later he reported to the ward to outline "Buerger's exercises in comfort" and to extol their effectiveness. His device was this. He had taken a pair of carpet slippers and through the toe of each driven a three-inch nail. Each end of a long stout piece of cord he had tied to each nail, so that it could be suspended over a hook in the ceiling, the slippers hanging some 24 inches from the floor. Thus he could seat himself in an easy chair with an adjustable back set low, and, with his feet in the slippers counterbalancing each other, indulge in his modified Buerger's exercises for several hours. His practice was to keep one foot on the floor, the other being counterbalanced well above the body for a period of from 2 to 3 minutes, and then to lower the one foot, thus raising the other for a similar period. This he would continue for 3 hours in the morning and 3 hours in the evening, reading a book the while and enjoying the mild exercise entailed. He maintained that its effectiveness was equal to that of the intermittent venous occlusion machine, and the clinical evidence in this case certainly corroborated his statement.

Diphtheria with Perforation of Larynx

Dr. J. D. ROLLESTON writes: The case described by Dr. R. W. Stephenson (Jan. 9, p. 60) under this title is most probably not an example of perforation of the larynx in diphtheria, of which, so far as I know, no instance has been recorded. Unlike scarlet fever, diphtheria does not cause deep ulceration. Dr. Stephenson's case seems rather to be an example of the very rare condition of which I collected seven cases, including one of my own, under the title "Non-surgical Subcutaneous Emphysema in Laryngeal Diphtheria" (*Brit. J. Child. Dis.*, 1928, **25**, 185). The most likely explanation of the emphysema is that put forward by Natalis Guillot to the effect that as the result of dyspnoea pulmonary emphysema occurs, that vesicles on the surface of the lung rupture, and that air passes into the hilum of the lung and so into the mediastinum and neck. A similar condition is found in measles, whooping-cough, and influenza.

Fulminating Purpura and Adrenal Haemorrhage

Dr. JAMES SHAW (Smethwick) writes: With regard to the correspondence about fulminating purpura, etc., perhaps such conditions are more common than is usually believed, but the cases do not find their way into the literature. Some few years ago I was called to see a child who was well and dead within a period of about eight hours. The child came out in large purpuric spots all over the body, and rapidly succumbed. I do not think there was any definite history of illness or of any associated illness of any member of the family. Dr. G. J. Jones of this borough and I did a post-mortem examination, and found what we thought to be definite evidence of adrenal haemorrhage. Curiously enough a child was admitted to hospital to-day in the early evening and died just after admission. There were haemorrhagic spots all over the body, some head retraction (but no Kernig's, etc.), T. 105° F., R. 70, definite pneumonia, convulsions, and death. The parents stated that she was playing about until 1 p.m.; she died at 7.30 p.m. She was observed to be fretful at 1 p.m. They admit that she had a cold yesterday and the day before, and after some questioning I elicited the fact that another child had had measles recently. The rash, however, did not appear morbilliform in type, and the haemorrhagic spots were punctate-like and discrete.

Books and Diversions

Hospital libraries started in a small way have proved their worth; they are now recognized departments, at all events in the larger institutions. Then there is what may be termed "diversional" therapy and the better-known occupational therapy. A correspondent, who is herself an organizer of diversional therapy at an E.M.S. hospital and supervisor of hospital libraries in a wide area, suggests that these three departments should be linked under an experienced welfare officer, whose staff would include a trained librarian and assistant librarians, a trained artist and her assistants, and a trained occupational therapist. The welfare officer would receive a list of patients from the doctors, and her staff would visit the wards in the case of those patients too ill to leave their beds and would receive others into the workshop. This correspondent has found the following work possible for bed-patients: making soft toys and dolls, string belts, gloves, and slippers, also embroidery, knitting, sewing, light fretwork, etc., and for patients in the workshop: carpentry, plastic modelling, cane work, weaving, painting, bookbinding, etc. A large part of the staff could, she considers, be voluntary.

Post-herpetic Pain and Paresis

Dr. MORRIS CUTNER (St. Mary's Hospital, W.2) writes: In the *Journal* of Jan. 12, 1935 (p. 91), while reporting the relief of post-herpetic pain to be obtained by the application of "red light" to that portion of the spinal cord whence arise the nerves corresponding to the distribution of the herpetic condition, I suggested that ultra-short-wave therapy, then being introduced into this country, "would appear to be an even better method of treatment." Owing to the kindness of the honorary staff of this hospital it has been possible to try out the suggestion. The results obtained were so impressive (details of cases are given in the *St. Mary's Hospital Gazette* of November, 1941) that ultra-short-wave has been adopted as the routine treatment. The relatively few failures we have had have been in cases in which the treatment had been delayed. In no case where treatment was started within a few days of the onset of the eruption has ultra-short-wave therapy failed to relieve at first and then cure the pain. While the virus responsible for herpes zoster normally attacks the posterior root ganglion, if it is sufficiently virulent it may also affect the corresponding lower motor neurone, producing paralysis (*Journal*, Feb. 15, 1941, p. 234; Dr. A. Barham Carter and John B. W. Dunlop). This latter effect suggests the possibility that, although the pathology of acute anterior poliomyelitis is different, the use of ultra-short-wave therapy may be useful in the acute stage of the disease. Once the paralyses have shown themselves, persistence of the pathological changes already present in the cord may perhaps be prevented by the application of ultra-short waves to those portions of the spinal cord involved. They produce a long-lasting heating effect, increase the defence mechanism of the infected area and also the permeability of the capillaries (which, in the case of anterior poliomyelitis, are engorged).

Corrigendum

Dr. NOEL F. ROWSTRON states that the penultimate sentence of his letter (Jan. 2, p. 21) should read "a proportion default," not "a large proportion default."